

Muschler

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A Manual Flora of Egypt

by

Dr. Reno Muschler

Assistant at the Royal Botanic Gardens, Dahlem-Berlin; Corresponding Member
of the „Institut Egyptien“ and others.

with a preface

by

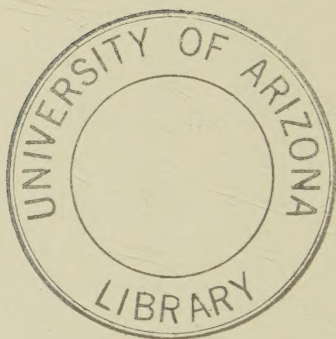
Prof. Paul Ascherson and Prof. Georg Schweinfurth

Vol. I.

Berlin

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This Work
is affectionately offered and inscribed to
Professor Dr. Freiherr Friedrich Wilhelm von Bissing
by
the Author.

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Preface.

Twenty five years ago, we gave, as the result of twenty years' researches, in the Memoirs of the "Institut Egyptien", a list of those phanerogams we had become acquainted with, within the boundaries of Egypt proper. This list we called "Illustration de la flore d'Egypte" imitating thereby Delile, the Botanist, who belonged to the epoch-making expedition under Napoléon Bonaparte who chose for his list of species the title "*Florae aegyptiacae illustratio*". Our work accordingly contained neither illustrations nor descriptions to enable anybody to name species collected in Egypt. Descriptions were only given to some plants diagnosed as new species or varieties. On that account we always referred to the voluminous work of Edmond Boissier, the "*Flora orientalis*" as it represented the only important one dealing with the descriptive Botany of the entire "Région du Dattier" and where one could find latin descriptions for most of the plants mentioned by us, though many of our species were wanting.

Beyond this work and apart from those monographs which deal with the floral regions of the entire world, there did not exist a single descriptive work which gave sufficient information concerning the flora of Egypt. George Post founded the descriptions in his "*Flora of Syria, Palestine and Sinai*" mostly on Boissier's work and a great number of Egyptian species which do not occur in the mentioned regions were omitted.

Whoever wanted to name Egyptian plants was obliged to make use of Boissier's great work, whose bulky volumes were a great encumbrance for a traveller, besides that only about the tenth part of the plants mentioned therein referred to Egyptian localities. Therefore one could not so easily gain information from it, as from a Flora confined to Egypt only. For some time already we had decided upon the publication of a more adequate work, dealing entirely with the Egyptian Flora, but owing to a great many more urgent tasks which took up all our time, we had to put off the realisation of this plan from one year to another.

Nevertheless we did not loose sight of our purpose, and every year since 1889, when we published a supplement to our Flora in the Memoirs of the "Institut Egyptien" we made all alterations necessary and remarks concerning names and new localities in our interleaved copies of our Flora. Many of these supplementary notes allude to those spontaneous species which were overlooked up to now, and also to many others which, through culture and agricultural transformation of the country have recently run wild. The total number of plants enumerated by us as belonging to the Flora of Egypt amounted, in the year of 1889, to 1316, of these not less than 117 were found in a naturalized condition. With all additions hitherto made, the unedited list of our Flora had reached at last the number of 1420 species. We both visited Egypt repeatedly; one of us went there five times for a prolonged sojourn, investigating all parts of the country; the other, with very few exceptions, lived there on and off for 40 years during the best season for plants — in fact, he is very much at home in Egypt and he was the first who explored most of the desert regions east of the Nile. Considering all this one will recognise how necessary would be a descriptive Flora of Egypt, especially as our "Illustration de la flore d'Egypte" became out of print.

With the present volumes therefore the author tries to satisfy this want. The most extensive and best arranged collections ever made in Egypt were at his disposal, and combined with his own knowledge of the conditions and explorations of the country he had sufficient material at hand. In spite of the numerous duties connected with his employment and considering his failing health he was nevertheless able to solve this difficult problem through persevering and ardent work in a comparatively short time.

Errors which are unavoidable in a work of such extent, especially as it was accomplished without any other assistance, will have to be corrected in further editions which might be expected. Instead of 1316 species of Phanerogams (incl. 3 ferns) which were known from Egypt in 1889, Muschler's new Flora enumerates 1503 — this number might however be considerably reduced if certain plants which are said to have been found only in a naturalized state are not counted. On the other hand some spontaneous species have been overlooked by mistake.

In consideration of the fact, that in Egypt two European languages, i. e. the English and the French tongue, are still contending for superiority, it was difficult to decide which one would be preferable for a scientific work that was also meant to be generally useful. As by far the greatest number of tourists who visit Egypt are English and American, and besides the country more or less belongs to the great British Empire, the English language has been

selected as most suitable for the purpose. Although to the Europeans, resident in Egypt, and to the educated Egyptians themselves the French tongue is at present more fluent, it cannot be denied that in those circles which are interested in Botany the knowledge of the English is predominant. Therefore nobody could entertain any doubt that the latter language would be more serviceable and appropriate for the present work.

Berlin, June 1912.

P. Ascherson,
G. Schweinfurth.

Introduction.

Twenty-five years have elapsed since Ascherson and Schweinfurth published their well-known "Illustration de la Flore d'Egypt" in the Mémoires de l'Institut Egyptien, Vol. II. Although no complete account of the plants of Egypt has since been prepared, botanical investigations have been carried on, and a large amount of fresh material has been obtained. In short, the want of a compendious Flora has long been a serious hindrance to the study of the indigenous vegetation, and a bar to inquiries of many kinds connected therewith.

The "Manual Flora of Egypt", which is the title adopted for the present work, is intended to comprise within a reasonable compass full descriptions of the whole of the indigenous and naturalized flowering-plants and ferns found within the limits of Egypt. In addition to the descriptions, I have given as fully as possibly the geographical range of each species within the country; and in the case of not endemic plants, a short statement of their range in other countries. I have also inserted, in a concise form, such general information, whether economic or scientific, as appeared to be of sufficient value. Believing that the main object of a Flora is to afford a ready means of determining the name of any species for the purpose of ulterior study, I have endeavoured so to frame the descriptive matter as to facilitate the work of identification as much as possible. I have therefore prefixed to each family and each genus analytical keys in which the salient characters of the genera and species are contracted. With respect to the descriptions themselves, they are mostly original and have been based on the actual examination of living or dried specimens, usually both. The descriptions were afterwards compared with those of my predecessors, and particularly with those of Boissier. and any additions or alterations that appeared to be necessary were made. With regard to the citation of previous authors, I have as a rule considered it unnecessary to do more than quote the publications that deal solely or mainly with Egyptian botany, such as Forskål's: *Flora aegyptiaco-arabica*, Delile's: *Florae aegyptiacae Illustratio*, Boissier's: *Flora orientalis*, Sickenberger's:

Contribution à la Flore d'Egypte and the works of Ascherson and Schweinfurth; usually I have given references to special monographs.

Every botanist who prepares a Flora starts from the standpoint reached by his predecessors in the same field. In the subjoined history of botanical discovery in Egypt I have endeavoured to give a sketch of the labours of all those who have investigated the botany of the country, either as authors or collectors. But in addition, it is advisable to briefly mention the chief material upon which the present work is founded. At the outset I must state that I have relied very largely upon my own notes and observations, formed during ten years' continuous study of the flora, upon my own herbarium and on those of Ascherson and Schweinfurth which I believe to be the largest and most complete formed by individual effort within Egypt.

I have now to express my gratitude to several botanists. First of all, I wish to render my special thanks to Professor P. Ascherson and Professor G. Schweinfurth, who have been at all times ready to give me the benefit of their wide knowledge and experience, and who have evinced the greatest possible interest in the inception and progress of this work. Many thanks are also due to Professor A. Engler and Professor J. Urban, the Directors of the Botanic Garden and Museum at Dahlem-Berlin, for their kindness in granting facilities for the comparison of my specimens with the types preserved in the Dahlem-Herbarium, and for other valuable assistance. Finally, I have to express my obligations to the Publishers Buschbeck and Budy (R. Friedländer & Sohn) for the assiduous care with which they have attended to the passage of the work through the press.

Berlin-Dahlem, June 1912.

Dr. Reno Muschler.

Manual Flora of Egypt.

Embryophyta asiphonogama.

Archegoniates.

Plants not bearing true flowers—that is, having no stamens nor ovules, and never producing seeds containing an embryo.

The two main features which distinguish the Archegoniates from the Thallophytes are the structure of the sexual organs and the distinct manner in which the peculiar phases known as alternation of generations is shown. The antheridium or male sexual organ is a well differentiated multicellular body which is either sunk in the adjacent tissues of the plant or is provided with a stalk. Within it are organized the sperms or spermatozoids, which are ciliate and swim freely in water. Corresponding to the oögonium of the Thallophytes is the archegonium or female sexual organ which gives name to the group. The archegonium is a flask-shaped cellular body consisting of a basal portion or venter, which contains a single egg, and a neck through which the sperms enter.

In the life history of this group of plants there are two generations or phases of development. During one stage the archegonium and antheridium are developed and this is known as the sexual generation, and as these organs give rise to gametes or sexual cells it is also spoken of as the gametophyte. By the union of the sex cells (sperm and egg) an oöspore is formed which germinates at once within the archegonium. That portion of the plant which develops from the oöspore gives rise to asexual spores and hence this phase is called the asexual generation. It is also spoken of as the sporophyte from the fact that it gives rise to spores. These spores are in the nature of resting spores and do not germinate on the plant as does the oöspore. They are distributed and on germination give rise to the gametophyte stage.

In some of the Archegoniates these two phases are combined in one plant as in the Bryophytes, whereas in other members of the group the two phases are represented by two distinct plants, that is, the gametophyte and sporophyte become independent of each other, as in the Ferns.

Pteridophyta.

Plants containing woody and vascular tissues. They produce spores asexually, each of which, on germination, develops into a prothallium (gametophyte). The prothallia bear the reproductive organs; the female organ is known as an archegone, the male as an antherid. As a result of the fertilization of an egg in the archegone by a sperm produced in the antherid, the asexual state of the plant is developed (sporophyte); this phase is represented by a fern or an allied plant.

The Pteridophytes constitute the second subdivision of the Archegoniates. Like the Bryophytes these plants show a distinct alternation of generations, i. e., the gametophyte or sexual generation alternates with the sporophyte or asexual generation. Their relation is, however, somewhat changed. In the Bryophytes the gametophyte is the most conspicuous and is looked upon as constituting the plant proper, whereas in the Pteridophytes the gametophyte is rather insignificant in size, while the sporophyte constitutes the generation or phase which is ordinarily regarded as the plant. In the higher members of the Pteridophytes the sporophyte is entirely detached from the gametophyte and is able to lead an independent existence. This group also shows a distinct advance in structure. There is a differentiation into root, stem and leaves, and the development of a system of conducting tissue known as the vascular system.

Filicales (Ferns.).

Terrestrial aquatic or epiphytic plants, various in habit. Sporangies developed from the epidermal tissues, on the back or margin of the leaf-blades, or in panicles formed from modified leaves. Spores of one sort or of two kinds (microspores and macrospores) contained in sporocarps; macrospores germinating into simple prothallia, which bear archegones, the microspores forming still simpler prothallia producing antherozoids.

- A. Spores all of one kind 1. **Polypodiaceae**.
- B. Spores of 2 kinds, macrosporangia and microsporangia 2. **Marsiliaceae**.

1. Polypodiaceae (Fern Family).

Plants various in habit. Rootstocks creeping or horizontal, elongated, or short and erect. Leaves various, coiled in veneration; blades entire, pinnate, pinnatifid or decompound. Sporangies borne in clusters

(sori) on the under side or margins of the leaf-blades, stalked, provided with a vertical ring, open transversely. Sori frequently with a membranous covering (indusium). Prothallia green.

Ferns constitute one of the largest and most generally distributed of the families of plants, and are found in all quarters of the world, although most abundant in moist climates. It is difficult to estimate the number of species, on account of the divergent views of authors, but they cannot be less than 3500.

1. *Adiantum* Linn. (Maiden's-Hair).

Sori oblong, placed transversely on the summit of a lobe or tooth of the frond, attached to an uninterrupted, veinlike receptacle, which connects the tips of the forked and free veins, and covered by a crescent-like indusium, continuous with the margin, and opening inwardly. — Rhizome creeping or tufted.

A well-marked genus of about 80 species, found in all tropical and subtropical countries, but most abundant in tropical South America. A few species are found in the temperate zone of both hemispheres.

The single Egyptian species is widely distributed.

1. *Adiantum capillus-Veneris* L. Spec. Plant. I (1753), p. 1568. — Boiss. Flor. Or. V, p. 730. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 180 no. 1258. — Rootstock creeping. Fronds clustered on long stipes, 12 to 20 cm long and sometimes nearly as broad, at first green, hairy, then black, glabrous, polished, tripinnate, pinnae and pinnules alternate, leaflets obliquely cuneate-obovate, destitute of main rib, with entire lateral margin and crenate or truncate-lobed tip. Sori at the end of most of the lobes and usually occupying their whole breadth. — Spor. December to March.

M. ma. Alexandria, in gardens; Ramle. — **N. d.** Alexandria; Lake Mareotis near Gabari, in ditches; Sidi Gabir; Mansura; Cairo: Walls near Shubra. — **N. f.** Fayûm, not rare. — **N. v.** Cairo: Walls in Old Cairo; Mekias (Nilomètre) Spor.-form not observed. — **D. a. sept.** Wady Natfe in pot of Gebel Gharib. — **O.** only from the Little Oasis, not common. —

Local name: Kuzbaret-el-bir (Delile).

This species is found in the temperate zones of both hemispheres.

2. *Marsiliaceae*.

Perennial plants, usually of small size, growing in marshes or in damp soil. Rhizome slender, creeping, rooting at the nodes. Leaves solitary or in tufts at the nodes of the rhizome, either fili-

form or of 4 leaflets borne at the top of a slender petiole. Sporocarps or conceptacles globose or oblong on short peduncles which rise from the petioles or near their bases, each sporocarp containing numerous cavities or cells, and each cell containing a group of sori composed of macrosporangia and microsporangia. Macrosporangia containing a single macrospore; microsporangia containing numerous microspores.

A small order of two genera (*Marsilia* and *Pilularia*) and 50 or 60 species, found in most temperate and tropical countries. In germination a small female prothallium is developed within the macrospore, at last bursting the prothallium protruding from the opening. A single archegonium is then formed on the prothallium, which is fertilised by spermatozoids set free by the bursting of the microspores, within which a rudimentary male prothallium bearing a single antheridium has been developed.

2. *Marsilia* Linn.

Sori linear several, often numerous on transverse veins proceeding from the upper side or midrib of the involucre, the indusia often more or less combined, dividing the involucre into 2 rows of transverse cells. Each sorus consisting of few macrosporangia, each one surrounded by several microsporangia. — Rhizome creeping and rooting at the nodes. Leaves with a long petiole or stipes, the lamina divided into 4 digitate leaflets with numerous forked veins radiating from their base. Involucres sessile or stipitate, their stipes often combined at the base with those of the barren fronds.

Tropical and warm temperate regions. Species 40—50.

A. Sporocarps 2—4 on each peduncle, leaflets glabrous 1. *M. diffusa*.

B. Sporocarps single on each peduncle, leaflets more or less pubescent. 2. *M. aegyptiaca*.

2. (1). ***Marsilia diffusa*** A. Br. in Flora (1839), p. 300. — Boiss. Flor. Or. V (1884), p. 750. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 180 no. 1259. — Rootstock thread-like, wide creeping. Whole plant quite glabrous, leaflets cuneate-obovate, quite entire, 1.5 cm long, 1.5 cm wide; sporocarps 2—4 on erect branching peduncles, glabrous.

O. Little Oasis, Ain Murun.

Also in the Canary Islands, Senegambia and in tropical Africa.

3. (2). ***Marsilia aegyptiaca*** Willd. Spec. Plant. V (1810), p. 540. — Boiss. Flor. Or. V, p. 750. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 180 no. 1260. — Plant robust, 10—25 cm tall. Leaflets more or less pubescent especially when young, 1 cm long, 1 cm wide or

narrower, usually undulate, 2--6-lobed; sporocarps single on each peduncle, densely villous, especially so when young.

N. d. Kafir Dowar; Damanhur; Fua; Damietta; Mansura; Tanta; Benha; Es-Sâlihiya; Qaliub; Mena'ir; Abu-Zabel; Cairo, ditches of railway; Bulaq; Embabe; in ditches, not rare. — **N. v.** Old Cairo; Giza; Abu Roash. — **N. f.** Medinet-el-Fayûm. — On borders of ponds and canals.

Local names: Qoreyyitah (Del.); qoreytah (Schweinf.-Muschler).

This species fills watercourses everywhere in Lower Egypt, but fruits rare.

Embryophyta siphonogama.

(Flowering and seedbearing plants. — Spermatophytes.)

The sexual generation is so far reduced as to be apparently obsolete; the non-sexual generation, or sporophyte, is advanced, heterosporous, with conspicuous-secondary-sexual characters which constitute flowers; the female sporophylls bear carpellary leaves, ultimately supporting seeds which contain the embryo; the male sporophylls form stamens and produce pollen.

The Spermatophytes, or Seed Plants, constitute the third of the great divisions into which plants are divided. The plants belonging to this division not only form the most conspicuous feature of the flora because of their size and general distribution, but also because of the fact that the flowering plants render a large number of them especially attractive. The plants of this group are also of great importance from an economic point of view. They furnish a large part of the food of man and other animals, as well as materials for clothing, shelter, fuel and divers other purposes. In this group of plants there is the highest differentiation of tissues and the most complicated structure. The one character which especially distinguishes them from the lower groups of plants is that of the production of seeds.

The plants have for the most part well differentiated stems and leaves, and represent the sporophyte or asexual generation. The sporophyte produces sporophylls which are of two kinds, namely, megasporophylls and microsporophylls. The megasporophylls bear small ellipsoidal bodies known as ovules, which develop into seeds. The megasporangium is not separate and distinct in the spermatophytes as it is in Selaginella, but is embedded within an ovule and corresponds to that part of the ovule known as the nucellus. The nucellus encloses the embryo-sac, which is regarded as a

megaspore. Each megasporangium (nucellus) therefore contains but a single megaspore, whereas in *Selaginella* the megasporangia contain from 1 to 8 megaspores. The microsporophyll bears microsporangia (pollen sacs) which contain microspores (pollen grains). The female gametophyte in the Spermatophytes is still more limited in its development than even in the highest Pteridophytes (as *Selaginella* and *Isoetes*) and remains wholly within the megaspore or embryo-sac. As a result of fertilisation of the egg-cell an embryo is produced which consists of root, stem and one or more cotyledons and which with the integuments covering it constitutes the seed.

Spermatophytes embrace two well defined groups, namely, Gymnosperms or naked-seeded plants and Angiosperms, or enclosed-seeded plants.

- A. Ovules and seeds borne on the face of a bract
or a scale: stigmas wanting 1. **Gymnospermae.**
- B. Ovules and seeds in a usually closed cavity
formed by 1 or several carpels (ovary): stigmas
present 2. **Angiospermae.**

Gymnospermae.

Carpel or pistil represented by a scale or disk upon whose face are borne the ovules (macrosporangia). Pollen-grains (microsporangia) divided into two or several cells, one of which gives rise to the pollen-tube (male-prothallium): a sperm cell or spermatozoid developed at the end of a pollen-tube directly fertilises an egg-cell in the archegone of the embryo-sac (female-prothallium in the ovule (macrosporangium). Perianth 0 or rarely (*Gnetaceae*) 2-lobed or utricular. Flowers always 1-sexual. Stamens few or many: cotyledons 2 or sometimes 3 or more.

3. **Gnetaceae** (*Ephedraceae*).

Evergreen shrubs or trees, with amentaceous, monoecious or dioecious flowers, subtended by sheaths or bracts. Staminate flowers: involucre bifid, enclosing 1 stamen or several with filaments connate in a column, with 2—4-celled anthers opening by a pore at the tip. Pistillate flowers: ovary solitary or twin, surrounded by a double or triple involucre, the outer with a narrow open mouth, the inner exerted in a tubule. Outer coating of seed leathery or fleshy. Embryo in axis of fleshy albumen, antitropous, with 2 cotyledons. —

A small family of only three genera and 80 species found in the Old World in the Mediterranean region, in the Orient and in the Himalaya and Altai Mountains. In the New World it occurs in the Mountains of America.

3. *Ephedra* Linn.

Flowers usually dioecious. Staminate aments ovate, bracts imbricated in 4 rows. Involucre of pistillate flowers of 2—3, fleshy, bifid sheaths, or 4—5, membranous, imbricated scales. — Shrubs often climbing, leafless or with small opposite, linear leaves, the nodes with short sheaths.

Species 80 over the Mediterranean region, the Himalaya, Altai, Orient, mountains of America, from California by Texas to Chili, Argentina and North and South Patagonia.

- A. Nutlets surrounded by a fleshy involucre, forming a false
 drupe; sheaths leafy 1. *E. alte*.
 B. Sheaths of fruiting involucre membranous, not fleshy,
 leafless 2. *E. alata*.

4. (1.) ***Ephedra alte*** C. A. Meyer, Monogr. d. Gattg. Eph. (1846), p. 75. — Boiss. Flor. Or. V, p. 715. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 180 no. 1256. — *E. aphylla* and *E. distachya* Forsk. Fl. Aeg.-Arab., p. LXXVII. — *E. altissima* Del. Descr. de l'Eg., p. 110 not Desf. — Ronghish, climbing; branches long, distorted; twigs whorled, often retrorse. Staminate catkins sessile, clustered with 5—6 anthers, sessile on a long exserted column; pistillate catkins 3—6 in a cluster, 2-flowered on a reflexed or recurved peduncle as long as or longer than flowers; sheaths 2—3 the lower short, truncate, the upper long, enclosing the nutlets; tubule short, straight. — January to June. —

M. ma. Matruqa; Abusir, near Mariut; Ramle; Abukir; Edku. — **M. p.** on sand-hills, growing in the loose sand near Rosetta. — **D. a. sept.** Wady Dugla near Helwan; Wady-Rished. Wady-Hof; Gebel ahmar near Cairo. — **D. i.** Wady Cheshen between Cairo and Suez; Wadi Hamata in the north of Gebel Atakah; Wady Kafura, Abu Sateir and Azhap in the northern Galala.

Local name: shedid.

Also in Cyrenaica, Syria, and Somali Land.

Growing in stony soil and most luxuriantly in localities where one would say nothing could possibly exist.

5. (2.) ***Ephedra alata*** Decne. Enum. plant. réc. p. Bové Ann. sc. nat. 2 sér. II (1835), p. 239. — *E. altissima* Bové non Desf. — Boiss. Flor. Or. V, p. 717. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 180 no. 1257. — Scabrous puberulent, not climbing, rigid, pale. Catkins sessile, crowded at ends and nodes of branches; the staminate, with 3—5, stipitate anthers on a somewhat exserted column; the pistillate 2-flowered, lutescent in fruit; leaves of involucre 4—5, loosely imbricated, and nearly equal in length, as long as ovate, acuminate, 3-angled nutlets. — Flow. March and April. —

M. p. rare. — **D. l.** near Khanka; near Cairo. — **D. i.** Wady Kafr between Cairo and Suez. — **D. a. sept.** Wady-Rished, Wady-Hof, Wady-Dugla near Helwan; Wady Gendeli near Dar-el-Beida; Wady Araba; Wady-Sid; between Megheta and the Nile. — **O.** Oasis Siwah. — Oasis Kharge; between Farâfra and Siut.

Local name: 'adam (Schweinf.).

Of this species Stapf (»Die Arten der Gattung Ephedra,« Wien (1889), p. 37) distinguishes two varieties which are geographically and systematically distinct. The one, var. *Decaisnei* Stapf, has only 4—5 anthers and is confined to the eastern part of the Lybian desert. the other, var. *alenda* Stapf has 6—8 anthers and is found only in the western part.

Only the var: *Decaisnei* Stapf is to be included in the Flora of Egypt. Also in the western parts of North Africa and in Sinai, Syria and Palestine.

Angiospermae.

Carpel or pistil a closed cavity formed by the uniting of the margins of a rudimentary leaf, or frequently of several leaves. The ovules (macrosporangies) are borne on the inner face of this cavity within it the seeds are matured. A pollen-grain alighting on the stigma (a specialized portion of the carpel) sends out a pollen-tube which penetrates the tissues of the carpel and on reaching an ovule enters its orifice (micropyle), or rarely the pollen-tube enters at the chalaza. Fertilisation is effected by a sperm-cell at the end of a pollen-tube coming in contact with an egg-cell in the embryo-sac.

Stems with the woody fibres scattered irregularly, not forming a separate zone of annual woody layers between the bark and pith. Embryo with one cotyledon

Monocotyledones.

Stems consisting of a pith in the centre, of bark on the outside, and these separated by one or more layers of fibrous or woody tissue, which, when the stem lives from year to year, increases by addition of new layers to the outside next the bark. Embryo usually with two opposite cotyledons

Dicotyledones.

Monocotyledones.

Stem consisting of a cellular axis traversed longitudinally by scattered closed vascular bundles, with no defined central pith or separable bark. Leaves usually with parallel veins. Parts of the flower generally in threes or fours, never in fives. Embryo with a single terminal cotyledon.

Besides the above positive characters, Monocotyledonous Plants may be generally known by their simple, entire, alternate or radical leaves, with simple parallel veins, the base usually encircling or sheathing the stem or the base of the next leaf; and the parts of the flowers are most frequently in threes; the calyx and corolla, when present, being generally similar in appearance, forming a single perianth of six parts. In several families, however, the perianth is entirely wanting, or reduced to a very few small-scales; in the Arum family the leaves are somewhat netted-veined; and in some Naiads they are opposite or whorled.

Pandanales.

Aquatic, or marsh-inhabiting herbs, perennial, mostly with elongated root-stocks. Leaves alternate, with narrow elongated blades. Flowers incomplete and imperfect, in elongated or head-like spikes. Perianth of bristles or scales. Androeceum of 2—7 stamens. Gynoeceum a single carpel, or rarely of 2 united carpels. Ovary 1.—2-celled. Fruit nut-like. Endosperm mealy or fleshy.

4. Typhaceae. — (Cat-tail Family.)

Tall reed-like marsh or aquatic herbs, with creeping rhizomes, solid cylindrical stems, and long linear leaves sheathing at the base. Flowers minute, monoecious, densely crowded in cylindrical spikes or spadices, male spadices always uppermost. Male flowers above; each with 2—7 stamens. Ovary 1—2-locular. Perianth of bristles; other bristles inwards. Seeds with endosperm.

A small family, cosmopolitan in distribution, consisting of only one genus found in Egypt and from 10 species.

4. Typha Linn.

Flowers monoecious, densely crowded in a terminal cylindrical spike furnished with a few deciduous spathaceous bracts; spikes either continuous or separated into two distinct parts by a broad or narrow interval, the upper portion male, the lower female. Male flowers of 1—7 stamens intermixed with capillary membranous scales; filaments short or long, distinct or connate; anthers linear-oblong, basifixed, 4-celled, longitudinally deliscent; connective produced at the tip. Female flowers with or without a linear-spathulate bracteole at the base. Ovary long-stalked, the stalk furnished with numerous silky hairs 1-celled, narrowed into a slender style; stigma unilateral, linguiform or spathulate; ovule solitary, pendulous. Fruit very minute, fusiform or narrow-ovoid; pericarp membranous or

coriaceous, at length laterally dehiscent. Seed the same shape as the pericarp; albumen farinaceous; embryo axile. — Tall reed-like marsh or aquatic herbs. —

Species 9 or 10, spread over most temperate and tropical regions.

A. Female flowers with bractlets 1. **T. angustata**.

B. Female flowers without bractlets 2. **T. latifolia**.

6. (1.) **Typha angustata** Bory et Chaub. Exped. Mor. (1832), p. 4 — Boiss. Flor. Or. V, p. 50. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 148 no. 1026. — Variable in stature 90 cm—1.5 m high. Leaves as long as the flowering-stems or sometimes exceeding them, narrowly linear. Spike variable in length, cylindrical; male portion usually continuous to the female part; female portion 6—10 cm long, 1—1.5 cm broad. Female flowers furnished at the base with filiforme ovate spatulate bractlets. — January to July.

M. p. Port Said, not rare. — **N. d.** Alexandria: Damietta; Shubra near Cairo; Near Abu Zabel. — **N. f.** Fayûn. — **O.** Great Oasis; Little Oasis; Farâfra; Dakhel. — **D. l.** Abu Roash. — **D. i.** in still water near Ismailia, Serapeum.

Local name: burdy; birdy (Wilkins., Schweinf.) dis (Aschers., Muschler).

Also found in the Mediterranean region (Greece), Orient, Northern India, Nubia and Abyssinia.

7. (2.) **Typha latifolia** L. Spec. Plant I (1753), p. 971. — Boiss. Flor. Or. V, p. 49. — Sickenberg. Contrib. Fl. d'Eg., p. 288. — Delile Ill. fl. d'Eg., p. 27. Fig. Bey. Stud. Sc. Egitt., p. 225. — Rootstock shortly creeping, with erect, reed-like stems, 90 cm to 1.5 m high. Leaves very long, erect and linear, sheathing at the base, but flat in the greater part of their length. Flowers in a continuous spike, often more than 30 cm long, the upper male portion rather thicker when in flower, yellow with the very numerous closely packed, linear anthers; the minute ovaries of the lower part are closely packed, and enveloped in a tuft of soft, brownish hairs. When in fruit, the upper part of the spike is a bare stalk, whilst the lower part has thickened by the enlargement of the nuts, still enveloped in the rusty down. — December. —

D. l. In great abundance in the moist low grounds of the Wadi-Natrûn.

Almost cosmopolitan.

Helobiae.

Flowers unisexual or bisexual, regular, naked or with a simple or double perianth. Stamens 1-indefinite; carpels 1-indefinite.

superior and free, or inferior. Embryo large, with a strongly developed hypocotyl; endosperm absent. Flowers solitary or in simple or compound inflorescences, often more or less enclosed in a spathe. — Marsh- and water-herbs of various habits.

5. Potamogetonaceae¹⁾ (Pondweed family).

Perennial aquatic herbs, generally submerged, sometimes with long-stalked floating leaves. Flowers unisexual or bisexual, regular, members solitary or in two- to four-merous whorls. Perianth rarely present, anthers sessile; carpels free, ovule solitary, generally suspended from the top of the ovary, and orthotropous; or more rarely attached laterally, and campylotropous. Fruits one-seeded, drupaceous, or with a membranous pericarp. Embryo with a strongly developed hypocotyl. —

A small family, dispersed over the whole world in marshy places, ponds, lakes, rivers etc., also including some widely spread marine plants. Genera 9, species estimated at 75. All the Egyptian genera have a wide range in both temperate and tropical climates.

A. Flowers spiked, perfect or polygamous:

I. Perigonium of 4 divisions. Floating in fresh or brackish water 3. *Potamogeton*.

II. Perigonium 0. Salt water plants.

a) Herbs with filiform leaves anthers cells and ovaries usually 4 4. *Ruppia*.

b) Herbs with strap-shaped leaves, stamens 3, ovary 1 2. *Posidonia*.

B. Flowers axillary, perfect, monoecious, dioecious, or polygamous:

I. Flowers monoecious, umbelled, fresh water plants 7. *Zannichellia*.

II. Flowers hermaphrodite, spiked, with a kind of spadix and spathe. Marine plants . . . 1. *Zostera*.

III. Flowers dioecious, solitary, clustered, cymose, marine plants.

a) Anthers equal, stigmas 2 5. *Cymodocea*.

b) Anthers unequal, stigma 1 6. *Diplanthera*.

¹⁾ The classification of the family adopted in this work is that followed by Ascherson and Graebner in their well-known „Potamogetonaceae“, in Engler „Das Pflanzenreich“, Leipzig 1907.

5. (1.) **Zostera** Linn.

Flowers perfect, naked, consisting of an anther above an ovary. Cells of anther connected by a semilunar crest, 1—3. dehiscence by longitudinal slits; pollen confervoid. Ovary spurred below, ending in a style, which is divided into two, band-like stigmas. Ovule pendulous. Fruit cylindrical, membranous, indehiscent. Embryo large. — Submerged, marine herbs, with a creeping, orange colored rootstock, rooting at nodes, the older portions soon rooting, the internodes usually curved. Branches erect, some short, sterile, others branched, fertile. Leaves distichous sheathing, ligulate, the lamina linear, entire, rounded and usually notched at the tip. Flowering stem flattened, inflorescence spiked, alternately 2-ranked at the anterior face of the tip of the axis (spadix), included in the split sheath of the uppermost floral leaf (spathe).

Six or seven closely allied species found in shallow water on the shores of most temperate regions.

8. **Zostera nana** Roth. Enum. Pl. Germ. I (1827), p. 8. — Boiss. Fl. Or. V, p. 25. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 144 no. 1010. — Rhizomes slender, matted. Leaves 6—12 cm long, rarely more, 5—7 mm broad, narrow-linear, truncate or obscurely notched at the tip, with 3—5 faint parallel nerves on each side of the stout midrib and distant transverse veinlets, margins thickened. Floral sheaths or spathes 1—2 cm long, on peduncles of equal length, the blade of the leaf continued above the sheath, the sheath itself much wider than the blade. Spadix 6—12-flowered, its margins with transverse membranous appendages folded inwards, one over each carpel. Stigmas usually protruding through the slit of the spathe. Fruit about 2 mm long, oblong, obscurely striate. —

M. ma. Beheret-el-brulus; Alexandria. Abukir: muddy and sandy shores usually between high-and low-water marks. — **M. p. es-Saraniq.** — Rosetta. — Lake Menzaleh.

Widely distributed in temperate seas.

6. (2.) **Posidonia** Koenig.

Flowers polygamous, naked. Perfect flowers: stamens 3, anthers sessile, the cells separated by an ovate-lanceolate or orbicular connective; pollen confervoid, ovary ovoid, 1-ovuled; stigma sessile; fruit drupe-like, at length irregularly dehiscent; seed oblong, teretish. Staminate flowers: stamens 3; ovary 0. — Immersed, stout marine herbs; rootstock thick, covered with the stumps of the withered leaves, which are ultimately resolved into fibres. Roots clustered, stout. Leaves distichous sheathing, equitant, with minute auricles,

short ligule, and linear lamina with rounded entire tip. Scape terminal, over-topped by the last branch, and so appearing lateral. The compound spike and spikelets sheathed by large, leaf-like bracts, the uppermost flower of the spikelet staminate, the rest perfect.

This genus is represented by two species; one found in the Mediterranean and on the west coast of the Spanish Peninsula, the other on the coast of extratropical Australia.

9. **Posidonia oceanica** (L.) Del. Flor. Aeg. Ill. (1813), p. 30. — Boiss. Flor. Or. V, p. 26. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 144 no. 1011. — *Zostera oceanica* L. Mant. I, p. 123. — Submerged old stems and leaves covered with long and fine filaments. Leaves often 30 to 75 cm long, 5—8 mm broad, rounded at the tip with rather numerous fine longitudinal veins. Scapes in the specimens seen about 45 cm long. Spikes 3 or 4 at short distances from each other, 5 to near 7 cm long, the undermost one pedunculate in the axil of a floral leaf longer than itself, the others sessile with shorter floral leaves, each with a pair of sheathing bracts at the base 1 to 2.5 cm long. Flowers 3 on each spike. Bracts and bracteoles shorter than the anthers, broadly ovate or orbicular, peltately attached and very deciduous except the attached centre which persists. Connectives ovate-lanceolate truncate with a subulate point, 3 to 7 mm long, the basal cells on the back about one fourth as long. Carpel contracted at the top, with a thick 2 to 4-lobed stigma. Fruit ovoid-lanceolate, 25—15 mm long, but not seen in quite ripe.

M. ma. Alexandria; Ramle; Abukîr.

Local name: shtenârah (Delile).

Limited to the Mediterranean and to the European shores of the Atlantic.

7. (3.) **Potamogeton** Linn.

Flowers small, bisexual ebracteate, sessile in a dense spike on an axillary peduncle arising from a membranous spathe. Perianth-segments 4, small, herbaceous, concave, valvate. Stamens 4, inserted at the base of the segments; anthers sessile, 2-celled, extrorse. Carpels usually 4, solitary, affixed to the inner angle of the cell, campylotropous. Ripe carpels or drupelets 4, small, coriaceous or spongy, ovoid or subglobose, obtuse or beaked by the recurved persistent stigma, 1-seeded. Seed curved, reniform; testa membranous; embryo with a large radicle and narrow incurved cotyledon. — Perennial aquatic herbs. Stems slender, simple or branched. Leaves wholly submerged and translucent, or floating and opaque, alternate or nearly opposite, entire or toothed; stipules intrafoliar, free or adnate to the petiole or base of the leaf.

A genus widely spread in the fresh or brackish waters of almost all temperate or subtropical regions, more are in the tropics: Species variously estimated at from 40 to 100 or more, according to the different views of authors, extremely variable, and most difficult of discrimination.

A. Lower leaves submerged, alternate, the floral floating, nearly opposite, dissimilar. Stipules free 1. *P. natans*.

B. All the leaves alike, submerged and alternate (except those under the peduncles which are nearly opposite).

I. Stipules free.

a) Leaves ovate or lanceolate.

1. Leaves, short-petioled, pellucid 2. *P. lucens*.

2. Leaves sessile, crisp-wavy at margin . . 3. *P. crispus*.

b) Leaves linear or filiform 4. *P. pusillus*.

II. Stipules adnate to the blades or the petioles

of the submerged leaves 5. *P. pectinatus*.

10. (1.) **Potamogeton natans** L. Spec. Plant. I (1753), p. 126. — Boiss. Flor. Or. V, p. 15. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 143 no. 998. — Stems creeping below, long or short, simple or sparingly branched, terete. Floating leaves on long petioles; lamina 4—8 cm long, oblong or elliptic or elliptic-lanceolate, acute or subacute, subcordate and shortly biplicate at the base, coriaceous, 20—30-nerved with copious cross-veins and minute areolation; stipules very long and conspicuous, 6—10 cm free, acuminate. Submerged leaves wanting or if present few and reduced to long and narrow phyllodes without any lamina. Peduncles stout, 4—8 cm long, bearing a dense-flowered spike 2.5—5 cm long. Perianth-segments broadly rhomboidal. Fruit 2 mm long, turgid, obliquely ovoid, keeled on the back when dry, beak short. — Fruit maturing in July and August.

N. d. Probably not uncommon in canals, ponds and ditches. In deeper or flowing water the plant becomes more slender and often wholly submerged.

A widely dispersed plant, found in nearly all temperate climates.

var. **serotinus** Boiss. Fl. Or. V (1884), p. 16. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 143 no. 998. — Leaves submerged and longer persistent; floating leaves smaller, more attenuate at the base. — Fruit maturing in October.

N. d. In ditches near Abu Akhdar; in canals at Kafr el Dowar near Alexandria; in ditches at Quis (Minia); Wady-Tumilat in still waters abundant; between Beni Masar and Ashruba; common near Damietta. — **N. v.** Abu Zabel.

Distinguished from the type by the smaller leaves, which are longer persistent.

11. (2.) **Potamogeton lucens** L. Spec. Plant ed. I (1753), p. 126. — Boiss. Fl. Or. V. p. 16. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 143 no. 999. — Stem stout, branching. Leaves mostly thickish, usually large, 5 to 12 cm long, oblong-lanceolate or oblanceolate, rather abruptly acute or acuminate, mucronate, often undulate-serrate, narrowed at base to a short petiole or sessile; stipules large, often spreading. Spikes 2,5 or 5 cm long; peduncles often elongated. Fruit rounded, 2,5 cm long, acute, slightly keeled, cotyledon incurved. —

N. d. Fresh water canal at Suez and at Ismailia, very abundant.

Very generally distributed over the area of the genus, in fresh and brackish waters.

12. (3.) **Potamogeton crispus** L. Spec. Plant. I (1753), p. 126. — Boiss. Flor. Or. V, p. 17. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 143 no. 1000. — Leaves all submerged, alternate and contracted at the base, except when under the branches or peduncles where they are opposite and stemclasping, all linear or narrow-oblong, very obtuse, the margins usually undulate-crisped, 2,5 to 5 or rarely nearly 6 cm long, with a strong central nerve and a slender one on each side at some distance from it. Stipules only seen on the young shoots. Peduncles rather long. Spikes usually 8 to 10 cm long. Fruits rather large, distinctly beaked, the dorsal rib or ribs entire or rarely denticulate. —

N. d. Mansura; in canals at Giza near Cairo; canals in the cultivated grounds of the Wady Tumilat; Sâlihiyia; between Cairo and Kenh very abundant; Kherbin; Wady-el-Hadgar. — **N. f.** in ditches at Tomia (Fayûm); Medînet-el-Fayûm. **N. v.** Aswân; Common on the edges of streams and irrigation-canals.

Common in the northern hemisphere.

13. (4.) **Potamogeton pusillus** L. Spec. Plant. I (1753), p. 183. — Boiss. Fl. Or. V. p. 18. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 143 no. 1001. — Distinguished from all the preceding species by the thread-like stems, and very narrow-linear leaves, like those of Zannichellia or Ruppia, and from the following by the scarious sheathing stipules, always observable in the axils of those leaves at least which are under the branches or peduncles. Leaves veined as in *P. pectinatus* L., 2,5 to 6 cm long and very seldom 2,5 mm broad. Peduncles slender, with a short, close spike of small flowers. Nuts small, ovoid, almost pointed, with a more or less strongly marked dorsal rib. — Fruit maturing in June and July. —

O. Little Oasis: Aîn Abu-Tillis; Great Oasis: Aîn Abdallah.

In pools, ditches, and still waters, fresh or salt, almost everywhere in the world.

14. (5.) **Potamogeton pectinatus** L. Spec. Plant. I (1753), p. 127. — Boiss. Fl. Or. V, p. 18. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 144 no. 1002. — Stems very slender, repeatedly dichotomous. Leaves all submerged very narrow-linear, 5 to 7 cm long, 1-nerved most of them dilated at the base into a rather long sheath, which is scarious at the edge and often projecting at the top into 2 small scarious lobes, the sheathing stipules of the other species wanting or rarely sheathing the base of the peduncle. Peduncles usually bearing several clusters of 2 or 3 flowers at some distance from each other, forming a slender interrupted spike, rarely reduced to a single terminal cluster. Nuts small, ovoid, almost pointed, with a more or less strongly marked dorsal rib. — Fruit maturing in June.

M. p. Rosetta; Port Said. — **N. d.** not rare. — **N. f.** in ditches near Tomia (Fayûm); Senhur; canal near Medinet-el-Fayûm. — **N. v.** near Geeinah; Saliyia. Dowar el Hud; Saqqâra; canals near Kafr-el-Hauwân, Suez. — **O.** Great Oasis. —

In pools, ditches, and still waters, fresh or salt, almost all over the world.

8. (4.) **Ruppia** Linn.

Flowers minute, bisexual 2 or more on a spike, at first, enclosed in the membranous leaf-sheath, but after flowering the filiform peduncle elongates greatly, and is either straight or spirally coiled. Perianth wanting. Stamens 2, opposite; filaments very short; anthers 2-celled, the cells distinct, opening outwards. Carpels 4 or more; stigma sessile, peltate; ovule solitary, pendulous from the apex of the cell. Fruiting carpels stipitate, obliquely ovoid, obtuse or beaked. Seed uncinate; testa membranous; embryo with a large thick hypocotyl and small incurved cotyledon. — Slender submerged much-branched herbs, usually growing in brackish water. Leaves alternate or nearly opposite, filiform, with broad sheathing bases.

A genus of either one variable species or of several closely allied ones, common in brackish waters in almost all temperate or tropical countries.

15. **Ruppia maritima** L. Spec. Plant. I (1753), p. 127. — Boiss. Flor. Or. V, p. 19. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 144 no. 1003. — Stems slender, filiform, variable in length, 12—30 cm leafy throughout. Leaves 5—10 cm long, filiform, with broad membranous sheathing bases. Flowers 2—6 together, at first completely enclosed in the inflated leaf-sheaths; but the spike gradually emerges, and is borne up to the surface of the water by the often conspicuously spirally coiled peduncle. Ripe carpels 2—3 mm long, greenish, obliquely ovoid, beaked; each one on a slender stipe sometimes more than 2,5 cm long. —

var. — **spiralis** (L.) Aschers. in Boiss. Fl. Or. V (1884), p. 18. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 144 no. 1003. *R. spiralis* Koch l. c. — Stems filiform, much branched. Leaves filiform. Peduncles very long after flowering, spirally twisted at base; cells of anthers oblong, carpels ovoid, oblique, erect, gradually tapering at tip, one-fourth to one-tenth as long as their stalk. — Flow. April to June.

M. p. Port Said. Also in the Sea; Lake Menzaleh near Mataria. — **O.** Great Oasis, Kharge, abundant in brackish water.

Local name: Hamul.

var. **rostrata** Agardh in Physiogr. Sällskap. (1823), p. 37. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 144 no. 1003. — *R. rostellata* Koch in Reichb. Ic. Pl. crit. II, p. 66 tab. CLXXIV. — Boiss. Fl. Or. V, p. 20. — Stems filiform, much branched. Leaves filiform-setaceous. Peduncles not elongated or spirally twisted after flowering; cells of anther nearly globular; carpels ovoid-semilunar, tapering, oblique at tip, one-fourth to one-tenth as long as their stalk. — Flow. March to April.

M. ma. Mandara, near Alexandria. — **M. p.** Rosetta; Lake Menzaleh; in salt ditches near Abu-el-Akdar. — **N. d.** Suez, in brackish water. — **N. f.** in the canal near Medinet-el-Fayûm. — **N. v.** Helwan in salt ditches very abundant; not rare. — **O.** Little Oasis. Ain Tobbêleh near Mendishe in fresh water (!); Siwah; Dakhel. — **D. a. mer.** not rare. — **R.** Qoseyr; between Zabû and Ras-Benass, Wady Gemâl.

Local name: hensalôd; hensislôd; hensalûd. (Klunzinger, Schweinf.)

Common in brackish waters in almost all temperate or subtropical countries. —

9. (5.) *Cymodocea* Koenig.

Flowers dioecious, naked. Staminate flowers: anthers 2, 4-celled, inserted on a peduncle as long as they, connate, their cells splitting lengthwise, ending in a subulate beak. Pollen confervoid. Pistillate flowers: carpels 2, side by side, each ending in two stigmas; ovule 1, pendulous from the tip of carpel, nearly orthotropous; carpel at maturity compressed, semi-ovate or semi-elliptical, bony, indehiscent. Seed free, testa separable. Embryo with a thick hypocotyl, the radicle lateral, the cotyledon cylindrical, appressed above in the axis, enclosing in its stocks rooting at nodes, and ringed with the scars of the fallen leaves. — Leaves in two rows, and, with the exception of the first leaves of the branches, frondose, their sheaths open, more or less two-auricled, produced into a strap at the base of the lamina.

The genus extends over the Old World coasts of the Atlantic and Pacific as well as of the Indian and Mediterranean seas, with one West Indian species.

- A. *Phycagrostis*. — Rootstock composed of short and long internodes, with short, erect branches. Leaves linear, furnished with air-ducts, denticulate or serrulate. Flowers solitary at tip of branches similar to the sterile ones, or in pseudo-lateral clusters.

I. Leaf-scars forming closed rings.

- a) Keel of the semiovate carpel entire or repand 1. *C. nodosa*.
 b) Keel of the carpel acutely coarse-dentate 2. *C. rotundata*.
 II. Leaf-scars forming open rings 3. *C. serrulata*.

- B. *Phycoschoenus*. — Rootstock as in last. Lamina of leaves terete, obtusish at tip, appearing dorsal owing to the conspicuous auricles at tip of sheath (which is persistent after the fall of the lamina) furnished with air-ducts. Flowering branch 2-ranked below. Inflorescence spiked-cymose 4. *C. isoëtifolia*.

- C. *Amphibolis*. — Rootstock with long, often much branched branches, woody, terete. Lamina of leaves broad-linear; destitute of air ducts; flowers solitary at tip of branches similar to the sterile ones, or in pseudo-lateral clusters 5. *C. ciliata*.

16. (1.) ***Cymodocea nodosa*** (Ucria) Aschers. Sitzber. Ges. Naturf. Freunde Berlin (1867), p. 4. — Boiss. Fl. Or. V, p. 21. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 144 no. 1004. — *Zostera nodosa* Ucria Pl. ad Lim. op. add. 30. — Rootstock creeping on the mud. Leaf-scars forming closed rings; sheath cylindrical, much longer than diameter, auricled; lamina 7-nerved, denticulate above; keel of semi-ovate carpel entire or repand — Flow. May.

M. ma. Near Ras-et-Tin at Alexandria. — **M. p.** Lake Menzaleh near Sheikh Hassan and near Tennis; Port Said. — Various places along the coast.

Local name: hamul-el-bahr.

Mediterranean Sea, African Atlantic coasts from Tanger to Senegambia.

17. (2.) ***Cymodocea rotundata*** Aschers. et Schweinf. Sitzber. Ges. Naturf. Freunde Berlin (1870), p. 84. — Boiss. Fl. Or. V, p. 21. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 144 no. 1005. — Rootstock creeping on the mud. Leaf-scars forming closed rings; sheath cylindrical, much longer than diameter, auricled; lamina 7—13-

nerved, denticulate above; keel of carpel acutely coarse-dentate. — Flow. April.

R. Egyptian coast between Qoseyr and Ras-Benass; Mirsa Wady Lekhuma.

Widely distributed in the Red Sea.

18. (3.) **Cymodocea serrulata** (R. Br.) Aschers. et Magnus Sitzber. Ges. Naturf. Freunde Berlin (1870), p. 84. — Boiss. Fl. Or. V, p. 22. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 144 no. 1006. — Caulinia serrulata R. Br. Prdr. Fl. Nov. Holl., p. 339. — Leafy branches not so hard as in *C. ciliata*, and the leaves or annular scars of fallen leaves distant leaf-scars forming open rings. Leaves broad linear, shorter than in *C. ciliata*, varying from 5 to 7 cm long, rounded and minutely denticulate or almost ciliate-serrulate at the end, the sheathing base rather longer than in *C. ciliata*. Fruit unknown. — Flow. September.

R. Qoseyr.

Red Sea coasts and also known from the Australian coasts.

19. (4.) **Cymodocea isoëtifolia** Aschers. Sitzber. Naturf. Freunde Berlin (1867), p. 3. — Boiss. Fl. Or. V, p. 22. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 144 no. 1007. — Habit of *C. serrulata*. Leaf-scars forming open rings; sheaths cylindrico-obconical; lamina fleshy, bright green, drying to a pale, glaucescent tint, longitudinally grooved, retuse and 3-toothed at the tip. — Flow. April to September.

R. Suez; Qoseyr; Mirsa Wady Lekhuma.

Read Sea; Indian and Pacific Ocean (Polynesia) between the Tropics.

20. (5.) **Cymodocea ciliata** (Forsk.) Aschers. Sitzber. Naturf. Freunde Berlin (1867), p. 3. — Boiss. Fl. Or. V, p. 23. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 144 no. 1008. — *Zostera ciliata* Forsk. Fl. aeg.-arab., p. 157. — *Thalassia ciliata* Koenig Ann. bot., p. 97. — Rhizome emitting hard almost woody stems of 6 or 8 cm to nearly 30 cm, marked with numerous annular scars of fallen leaves and ending in a tuft of broad linear leaves, usually falcate, 2 to 12 cm long and about 8 mm broad, rounded and ciliate-serrulate at the end, contracted at the base into a short brown sheath clasping the stem all round, the margins closing at the base but not united. Fruits unknown.

R. Suez.

Widely distributed in the Red Sea and the Indian Ocean to North-East Australia.

10. (6.) **Diplanthera** Thou.

Flowers dioecious, naked. Staminate flowers: anthers 2, 4-celled, inserted on a peduncle as long as they, one is exerted as much

beyond the other as the length of the latter. Pollen confervoid. Pistillate flowers: carpel with one stigma; ovule 1, pendulous from the tip of carpel, nearly orthotropous; carpel at maturity compressed, semi-ovate or semi-elliptical, bony, indehiscent. Seed free, testa separable. Embryo with a thick hypocotyl, the radicle lateral, the cotyledon cylindrical, appressed above in the axis, enclosing in its sheath a well formed plumule. — Marine plants, with slender rootstock, ringed by the prominent scars of fallen leaves. Sheaths cylindrical, 2-aucled, ligulate. Lamina linear, with 2 acute, lateral teeth at the tip, and a median and 2 margin nerves, secondary nerves obscure. Staminate flower on a rather long peduncle; pistillate with only the tips of the stigmas exerted.

Tropical and subtropical marine plants.

21. *Diplanthera uninervis* (Forsk.) Aschers. in Engler Natürl. Pflanzenfam. Nachtr. (1897), p. 37. — *Zostera uninervis* Forsk. Fl. aeg.-arab., p. 157. — *Halodule uninervis* Aschers. in Boiss. Fl. Or. V, p. 24. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 144 no. 1009. — Lamina scarcely produced into a rounded tip between the teeth, often tridentate by the excurrent of the median nerve. — Flow. April.

R. Suez, abundant in the Gulf. Gimsa: Qoseyr. Mirsa Wady Lekhuma.

Common in the Red Sea and in the Indian and Pacific Ocean (Polynesia).

11. (7.) *Zannichellia* Linn.

Flowers minute, axillary, monoecious, a single male and female enclosed in the membranous leaf-sheaths. Male flower: Perianth wanting. Stamen 1; filament short at first, elongating as the flower expands; anther 2—4 celled, linear basifixed, cells dehiscing laterally, connective produced, apiculate. Female flower: Perianth short, cupular, hyaline. Carpels 2—6, sessile; styles long or short, stigma large, obliquely peltate, crenate; ovule solitary, pendulous, orthotropous. Ripe carpels usually 3 or 4, sessile or stalked, curved oblong or oblong-reniform, slightly compressed, tubercled or crenate or smooth on the back, beaked by the projecting style. Seed pendulous; testa membranous; embryo cylindric, the cotyledonary end bent into a short coil. Slender submerged water-plants; stems filiform, branched. Leaves usually nearly opposite, filiform, sheathing at the base; Sheaths stipular.

An almost cosmopolitan genus of 4 or 5 closely allied species, probably all forms of ours.

22. **Zannichellia palustris** L. Spec. Plant. I. (1753). p. 969. — Boiss. Fl. Or. V. p. 14. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 143 no. 997. — Stems very slender, much branched, leafy throughout, often forming dense masses, 6—28 cm long. Leaves opposite or subwhorled, very slender, 1—6 cm long, filiform, flat. Flowers sessile or very shortly pedicelled fruiting carpels 3 or 4, about 1 mm long, stipitate or almost sessile, curved, smooth or very obscurely crenate on the back; styles from half to almost as long as the carpels. — Flow. February.

N. d. Alexandria; Damietta; in fresh and brackish water; Ponds near Zagazig; in cultivated grounds near Salîhiya; near Abu Hamad; Belbeys; Khanka; Bulaq; Giza; Benha in ditches. — **N. v.** Suez. — **N. f.** near Sêrsene (Fayûm); Medinet-el-Fayûm. — **O.** Great Oasis: Ain Kharrân; el Kharge; Little Oasis; Dakhel.

Local name: lamh-en-naqa'.

A cosmopolitan species wanting only in Australia but found in New Zealand.

6. Naiadaceae.

Annual submerged herbs, with fibrous roots and slender branching stems. Leaves alternate, nearly opposite or whorled: blades various, dilated and sheathing at the base, mostly toothed. Flowers dioecious, solitary. Staminate flowers with a double perianth, the outer entire or 4-horned, the inner hyaline, adhering to the solitary stamen. Anther sessile or short-stalked, 1-4-celled, apiculate or 2-lobed at the apex. Pistillate flowers with a single ovary, topped by a short style and 2—4 stigmas. Fruit a sessile drupelet, with a crustaceous pericarp and a membranous endocarp. Seed solitary, filling the pericarp.

One genus only, *Naias*, a simple and probably primitive form of world-wide distribution; species about 30.

12. *Naias* Linn.¹⁾

Flowers monoecious or dioecious, solitary. Staminate flower: outer involucre calyptra-like, 2—4-cleft at the tip, or tubular, tapering and denticulate at the tip, the inner coalesced with the anther, deliscent with it. Pistillate flowers: stigmas subulate, papillose along their inner face. Aquatic, submerged annuals, with stiff, branching, slender stems, linear, spiny-denticulate, or nearly entire,

¹⁾ The classification of the genus adopted in this work is that fallowed by Rendle in his well-known Systematical Revision of the genus *Naias* in Trans. Linn. Soc. Ser. 2 Vol. V (1899).

nearly opposite, leaves which are dilated at base and obliquely decussate, the succeeding pairs winding spirally around the stem, the young leaves clustered in the axils.

Naias was formerly included in the Potamogetonaceae. The extreme simplicity of the flowers warrants its separation as a distinct order.

A small genus dispersed over the whole world in marshy places, ponds, lakes, rivers, etc.

A. Flower dioecious 1. *N. marina*.

B. Flowers monoecious

I. Male flowers in a membranous spathe, female flowers naked

a) Anther 1-celled, leaves rigid 2. *N. minor*.

b) Anther 4-celled, leaves flaccid 3. *N. horrida*.

II. Male and female flowers naked 4. *N. graminea*.

23. (1.) ***Naias marina* L. var. *muricata*** (Del) A. Br. ex K. Schumann in Fl. Bras. III. 3. (1894), p. 725 non Hartm. — Rendle System. Rev. *Naias*, p. 397. — *Naias muricata* Del. Fl. Eg. (1812), p. 281 tab. 50 Fig. 1. — Boiss. Fl. Or. V. p. 27. — Aschers.-Schweinf. III. Fl. d'Eg., p. 144 no. 1012. — Plants attached at the base of the stem and at the lower nodes of the shoots by fibrous, often brownish-coloured roots. In the fresh state the stem and leaves are extremely brittle, the former breaking at a touch or with its own weight when lifted from the water. Stem branching immediately above the base: shoots generally creeping at the lower nodes and ascending above. Internodes varying in length 1 to 2.5 cm (longer in the Egyptian than in the Ceylon specimens) 2 mm wide, thickly covered with short spines. Leaves 1 to 1.5 cm long 2 mm broad, bearing 7 to 10 patent triangular teeth on each side, equal to or generally exceeding in length the leaf-width; the back bears 3 to 5 spines, the sheath generally two prominent teeth on the shoulder and often a spine on the back. Male flower 2 mm to 3 mm long; anther when young completely envelopped in the spathe — or perianth, the cells of which contain a bright red sap; before dehiscence the short stalk grows and the flower is pushed through the spathe, which becomes split laterally. Female flower when mature about 2 cm long, the ovary occupying about one-third of the whole length when three stigmas are, as usual, present, one is often smaller than the others. Seed 12 cm long by 2 mm broad, distinctly marked with small 4 — 5 polygonal areolae. — Flow. March.

N. d. Alexandria; Kafr Dowar; Ramle; Rosetta; Fanskur Ssebe near Damietta; Drain Bussili, between Bussili and Edfina (Behera). — **N. f.** Still water near Medinet-el-Fayûm.

Local name: horreish. (Roth).

Also known from Ceylon, but the Ceylon form has the internodes shorter than the Egyptian specimens.

24. (2.) **Naias minor** All. Fl. pedemont. II (1785), p. 221. — Rendlel. c., p. 410. — Boiss. Fl. Or. V, p. 28. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 145 no. 1014. — The main stem branches immediately above the base. The habit varies according to the length of the internodes. The lower internodes vary in length from scarcely 1 to 6 or 8 cm with a maximum breadth of 1 mm, their length decreases gradually upward, and at the tips of the shoots the leaves are closely crowded. Leaves linear-tapering, with a broad sheath, and in the more typical forms stiff, bent upward along the midrib and falcately recurved, while the margin bears a few patent teeth with a broad base ending in an upcurved or ascending spine. Sheaths broad, 2 to 3 mm long, generally truncately rounded, with a few rather prominent teeth on each shoulder. Flowers protected by the leaf-sheath, male and female often found in successive nodes. Male about 1.5 mm long before elongation of stalk proceeding anther-dehiscence. Spathe ellipsoidal, elongated below, and ending above the perianth in a shortly cylindrical neck, irregularly spiny-toothed at and beneath the mouth; perianth closely investing the shortly-stalked, ellipsoidal anther, above which it terminates in a pair of thick closed lips. Female flowers about 2.5 mm long, of which the sessile ovary occupies about a third; style long, almost cylindrical or slightly tapering, ending in two unequal stigmata. Seed with 12 to 18 longitudinal rows of transversely-elongated ladder-like pits (in dried plants plainly visible through the pericarp). — Flow. March.

N. d. Damanhur; Damietta; Shubra; Suez. — **O.** Ain Abu Tillis at Bawiti (Little Oasis).

Local name: hamûl.

Also found in Europe, Asia Minor, Syria, Kurdistan, Persia, Afghanistan, India, Burmah, Malacca and Manchuria.

25. (3.) **Naias horrida** A. Br. ex Magnus. Beiträge (1870). p. 46, 47. — Rendle Rev. gen. Naias, p. 422 tab. 42 fig. 183—191. — Rendle in Engl. Pflanzenreich VII, p. 17 no. 30. — *Naias pectinata* Magnus in Aschers.-Schweinf. Ill. Fl. d'Eg. (1889), p. 145. — Main shoots long and spreading, with short lateral branches, passing after a few short internodes into a dense bushy head. Lower internodes often very long, sometimes reaching 12 cm, often about 5 or 6 cm. Leaves with minutely bispinulose apex, the margins armed with large triangular spreading teeth, longer than the leaf-width, ending in a small, rigid, dark brown spine. In robust specimens the blade reaches

2 cm in length by 7.5 mm in width about the middle, with about 8 teeth projecting 1 mm. From the margin in the lower leaf, becoming shorter as the leaf narrows above, but still slightly exceeding its width; the midrib is prominent, and narrow bands run at right angles from it towards the margin: the broad truncately-rounded sheath is 2.4 to 3.3 mm long by 1.75 to 3.3 mm broad; the rounded shoulders bear from 4 to 6 minute teeth, decreasing in size from above downward. Male flowers 2.5 to 3 mm long; spathe-neck cylindrical, scarcely 5 mm long, the mouth bearing a few short spines; perianth subelliptical. Ovary about 2 mm long; stigmas broad, spreading, linear-tapering. Seed plainly marked with about 20 rows of squarish pits. — Flow. April.

N. d. Ditches near Sherbîn. — **N. f.** Medinet-el-Fayûm.

Also known from tropical Africa. Rendle says: (Revision of the genus *Naias* in Transact. Linn. Soc. 2. Ser. V (1899), p. 423) „I have not seen the Egyptian specimen on which the account is based, and it may perhaps represent another species.“ But the specimens from Sherbîn appear to me undoubtedly to be the typical *Naias horrida*.

26. (4.) ***Naias graminea*** Del. Descr. Egypte. Hist. Nat. II (1813), p. 282 tab. 50 fig. 3. — Rendle l. c., p. 424. — Boiss. Fl. Or. V. p. 28. — Aschers.-Schweinf. Ill. Fl. d'Ég., p. 145 no. 1015. — *N. graminea* var. Delilei Magnus in Ber. Deutsch. Bot. Ges. II (1883), p. 522. — *N. graminea* var. *vulgata* Magnus Ber. Deutsch. Bot. Ges. I (1883), p. 522. Habit grass-like, the long shoots rooting at the lower nodes and forming new plants by death of the older connecting parts; lateral branches sometimes very short, forming a densely-leaved tassel, and when the internodes on the main stem are also short, giving the plant a dense cylindrical habit. Leaves from 1.5 to 2.5 cm long 4 to 6 mm broad. Sheaths from 2.5 to 3.25 cm long, including the auricle; the latter bears a few rather small teeth on both inner and outer edge, about two altogether.

Flowers borne on the short lateral shoots, often several at the same node. Male flowers before dehiscence of an anther about 1 mm long; perianth ending directly above the anther in two rounded earlike lobes, which may be somewhat oblique. Female flowers 1.3 to 1.6 mm long. Fruits solitary or 2 to 4 crowded together at the base of the dwarf shoots; narrowly oblong or narrowly ellipsoidal or ellipsoidal-oblong, tapering more at the tip. Seed 1.75 to 2.5 mm long. — Flow. April.

N. d. Rosetta, Damietta, Menzaleh.

N. v. Benha, Cairo. —

O. Great Oasis, in still water; Dakhel. —

Generally distributed throughout the warmer parts of the Old World. One specimen known from South America! Introduced or perhaps a mis-

take.) Below the epidermis runs a single row of long, narrow, colourless, supporting cells (libriform cells); these are absent in some Egyptian and Syrian specimens, which Magnus (Ber. Deutsch. Bot. Ges. I. (1883) p. 522) has separated as the variety *Delilei*. As, however, these specimens can be distinguished by no other character, their habit, leaf-sheaths, marginal teeth, flowers, fruits, and seeds conforming to those of the type, which moreover grows in the same area, I have following Rendle ventured to disregard the variety.

7. Alismataceae.

Marsh or water plants. Leaves basilar on long petioles. Flowering stems leafless, or rarely leafy. Flowers in terminal umbells, racemes and panicles. Flowers hermaphrodite or unisexual, regular. Perianth when perfect of 6 segments, imbricate in 2 series, the 3 outer ones membranous or herbaceous, the 3 inner larger and petal-like, often very fugacious. Stamens 6—9 or indefinite, hypogynous or slightly connected with the base of the segments, but when isomerous with them not usually opposite their centres; filaments filiform or flattened; anthers erect, with 2 parallel cells opening laterally in longitudinal slits. Ovary of 3—6 or many carpels, quite distinct or shortly connate, each tapering into a short style or with a sessile terminal stigma; ovules 1—2 or few, erect from the base of the cavity, or the funicle of the inner one shortly adnate to the inner angle, or numerous and parietal. In fruit the carpels ripen into indehiscent nutlets, or when several-seeded are variously dehiscent. Seeds erect or when several ascending or spreading, with a thin testa and inner membrane; no albumen. Embryo either straight and of the shape of the seed, or more frequently horse-shoe shaped; radicle inferior.

Marsh or water plants, with generally a stout rhizome, radical leaves and a large, much branched inflorescence. Genera 14, species 50 found in temperate and warm zones.

A. Carpels 1-seeded, indehiscent, scarcely beaked . 1. **Alisma**.

B. Carpels 2-seeded, tapering into divaricate beaks

falling off by a transverse rupture near the base 2. **Damasonium**.

13. (1.) **Alisma** Linn.

Flowers usually hermaphrodite. Perianth of 6 segments, 3 outer ones membranous or almost herbaceous, 3 inner large and petal-like. Stamens 6. Ovules solitary in each carpel. Fruit carpels indehiscent, either about 6 or numerous, arranged in a ring round the depressed axis, or irregularly crowded in a globular head. Seed ovate or oblong with a horse-shoe embryo. — Aquatic herbs, erect

or in not Egyptian species floating, with radical leaves on long petioles. Flowers either in a terminal umbel with or without whorls of pedicellate flowers below it, or in a panicle with whorled branches, each bearing a similar umbel.

This genus is widely spread over the temperate and warm regions of the globe.

27. (1.) **Alisma plantago** L. Spec. Plant. I (1753), p. 343. — Boiss. Fl. Or. V. p. 9. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 143 no. 994. Rootstock perennial, sometimes very hard and almost bulbous with the thickened sheathing bases of the petioles. Leaves ovate oblong or elliptical, shortly acuminate, 6 to 9 cm long in well-grown specimens, usually 7-nerved, the transverse veinlets very oblique, not close, and more or less connected by reticulations. Flowering stem 30 to 50 cm high, with a large loose panicle often above 30 cm long, with whorled divaricate branches and pedicles. Outer perianth-segments ovate, striate, persistent, about 1 cm long; inner ones twice as large, of a pale pink, very fugacious. Carpels 15 to 30, obovate, laterally flattened, 1 to $1\frac{1}{4}$ cm long, bearing the remains of the style on the inner edge below the apex, and marked on the back with an impressed or slightly prominent dorsal nerve, the whole forming a flat ring of $2\frac{1}{2}$ to 3 cm diameter with a depressed centre. — Flow. March.

N. d. Damanhur in ditches. — **O.** Dakhel.

Common in Europe, Asia, Africa, America and Australia.

— — **var. arcuatum** (Michalet) Buchenau, Ind. crit. in Abhdlg. Nat. Ver. Bremen II (1871), p. 34. — *A. arcuatum* Michalet in Bull. Soc. Bot. France I (1854), p. 312. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 143 no. 995. — *A. plantago* var. *decumbens* Boiss. Fl. Or. V. p. 9. — Rootstock slender, longer than broad. Leaves lanceolate or linear, shorter petioled; petals red. — Flow. March.

N. d. In watery ditches, Shubra; in ponds near Cairo; in still waters near el-Menair; Abu Zabel; Belbeys; Zaqaziq; Sarasin. —

14. (2.) **Damasonium** Juss.

Flowers hermaphrodite. Perianth of 6 segments, 3 outer ones membranous, 3 inner larger and petal-like and very fugacious. Stamens 6. Ovules 2 in each carpel. Fruit carpels 6 to 9 or rarely more, laterally flattened, adnate by their broad base to the convex or conical receptacle, tapering into a beak, spreading, when ripe usually breaking of transversely near the base. Seeds 2 or solitary by abortion. Embryo horse-shoe shaped. — Aquatic or marsh herbs, with the habit of the *Alismas*.

The genus comprises four species, all closely allied to each other, and possibly varieties of one. The Egyptian species is a Western Mediterranean plant, which gets into the north-western parts of Europe; other species occur in California and Australia.

28. **Damasonium alisma** Mill. var. **compactum** Micheli in DC. Monogr. Phanerog. III (1881), p. 42. — Buchenau in Engler Pflanzenreich IV. 5. p. 19. — D. Bourgaei Coss. Notes plant. nouv. ou crit. du midi de l'Espagne II, p. 47. — Boiss. Fl. Or. V, p. 10. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 143 no. 996. — Leaves long-petioled, oblong with cuneate, truncate, or cordate base, 3—5 nerved. Scapes thickish, longer than leaves; whorls 5—20-flowered, remote or approximated, forming an interrupted spike or few-branched panicle; pedicels as long as fruits to thrice as long; petals white, rhomboid-ovate, short-clawed; carpels triquetrous-lanceolate, acute, strongly nerved nearly to the tip of beak; seeds oblong-cylindrical, muriculate.

N. d. In ditches near Alexandria; in fields near Cairo; in ponds near Shubra; in ditches near el-Merg; Birket-el-hadj; Abu-Zabel; in ditches near Belbeys; between Gassasin and Tell-el-Kebir; at Bahtit near Abu-Hamad; in ponds near Shuka; at Geraïie near Zaqaziq. — **N. f.** at Tomia (Fayûm).

This species is also common in the Mediterranean and Atlantic region.

8. Hydrocharitaceae.

Aquatic herbs, entirely submerged or the lamina of the leaves floating. Leaves undivided. Flowers springing from, or more or less enclosed in a spathe; uni- or bisexual and regular, with a perianth generally distinguished into calyx and corolla, each of three members. Stamens in from 1 to 5 trimerous whorls, the inner being often replaced by staminodes. Carpels 2—15, ovary inferior, one-celled, with parietal placentas which are often produced into the centre, without however uniting. Ovules generally numerous, position various. The leathery or fleshy fruit opens irregularly, exposing the seeds, which contain a large embryo and no endosperm.

About fifty species in fifteen genera, twelve of which occur in fresh water, three in the sea.

I. Carpels 3, parietal placentas not produced into the centre of the ovary; apetalous 1. *Halophila*.

II. Carpels 6—15; parietal placentas produced into the centre of the ovary; petalous.

A. Branches with crowded distichous strap-shaped leaves, flowers unisexual 2. *Thalassia*.

B. Leaves on long petioles dilated and tufted at the bottom of the water, flowers bisexual 3. *Ottelia*.

15. (1.) **Halophila** Thouars.

Staminate flowers: perianth simple, 3-leaved, stamens 3 alternating with the leaves of perianth; anthers sessile, extrorse, 4-(rarely 2-) celled. Pistillate flowers: perianth minute, 3—2-(sometimes 4—5) lobed; ovary bottle-shaped, with 2—5, usually 3 placentas, parietal, the ovules usually numerous, anatropous, ascending. Stigmas 2—5, (more often 3) inserted between the leaves of the perianth, much longer than they, filiform, grooved at the inner face. Fruit membranous. Seeds usually numerous, nearly globular, the testa easily separating. Embryo thick, hollowed at the tip, to receive the cotyledon from the sheath-like cavity of which projects the plumule. — Marine, submerged, perennial herbs. Leaves approximated in pairs, frond-like, the blade 3-nerved. Flowers sheathed by a 2-leaved spathe, at the end of short branches, the staminate peduncled, the pistillate sessile.

A genus found from the Red Sea to Indian Ocean and South Seas; Tropical Atlantic Ocean (America).

- I. Frondous-leaves oval or oblong-elliptical, supported on a slender petiole about twice or three times its length; entire 1. *H. ovalis*.
- II. Frondous-leaves broadly linear, bordered by small acute teeth or cilia, tapering into a short petiole . 2. *H. stipulacea*.

29. (1.) **Halophila ovalis** (R. Br.) I. D. Hook. in Fl. Tasm. II. (1860), p. 45. — Boiss. Fl. Or. V, p. 2. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 143 no. 990. — Balfour. The genus *Halophila*, p. 47. — The structure of the stem is simple, like that in the generality of water-plants. The scale-leaves are oblong-oval, sometimes slightly emarginate, about 5—6 mm long by 4 mm broad. The frondous leaves have an oval or oblong-elliptical lamina, supported on a slender petiole about twice or three times its length. The male flower consists of three sessile four-celled anthers closely appressed and supported on a long pedicel. These are surrounded by a perianth of three imbricated elliptical-oval segments which completely enclose them and have in the living plant a bright scarlet line down the back. The female flower is sessile or sub-sessile, and is enclosed by the double-leaved translucent spathe, through which its form is easily seen. It is composed of three carpels confluent to form a thin-walled, one-celled ovary, filled with a viscid mucilage, and from the walls of which three parietal placentas project. The fruit is a globular capsule, surmounted by a beak, on the top of which are visible the scars of the removed styles, and the remains of the perianth.

R. Gulf of Suez; Qoseyr. —

Also known from the Indian Ocean and South Seas.

30. (2.) **Halophila stipulacea** (Forsk.) Aschers. in Sitzungsber. Ges. Naturf. Freunde zu Berlin, Jan. 1867 und Bot. Zeitg. XXV (1867), p. 95. — Boiss. Fl. Or. V, p. 3. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 143 no. 991. — Balfour l. c., p. 47. — Blade of twin leaves oblong-elliptical to elliptical-lanceolate, 9 mm to 7 mm long, 7 mm broad, tapering to a usually short petiole, which is sheathed at base by a scarious scale. Flowers like in *H. ovalis*.

R. Gulf of Suez: Qoseyr. Mirsa Wady Lekhuma; Mirsa Sobanga. —

Also known from the Indian Ocean.

16. (2.) **Thalassia** Solander.

Flowers dioecious, solitary in narrow spathes of two bracts: these united into a tube at the base. Staminate flowers long pedicelled: perianth of 3 petaloid sepals, stamens 6, filaments very short, anthers opening laterally. Pistillate flower nearly sessile in the spathe, caducous, ovary 6—9-celled, beaked. Fruit stalked, rugose or nearly echinate, opening by many valves. Seed numerous. — Marine herbs, with elongated rootstocks. Leaves several at a joint, sheathing at the base; blades linear, elongated. Scape arising from the short stem.

This Genus is found in the tropical Indian and Pacific Oceans and in the Atlantic Ocean (shores of Tropical America).

31. **Thalassia Hemprichii** (Ehrenbg.) Aschers. in Boiss. Fl. Or. V (1884), p. 7. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 143 no. 993. — Schizotheca Hemprichii Ehrenbg. Symb. Phys. Bot. tab. XI, 1. — Submersed, glabrous. Rootstocks creeping, elongated, stems short, arising from the nodes of the rootstock. Leaves sheathing the stem, blades linear or linear-lanceolate, 9—15-nerved, strap-like, 2—3 dm long, 1 to 2 cm broad, obtuse, withering-persistent. Capsule at least born into numerous linear-stripes.

R. Qoseyr.

Local name: Kebân-el-qasab.

Extending to the Indian and Pacific Ocean.

17. (3.) **Ottelia** Pers.

Flowers bisexual, solitary and sessile within a tubular 2-lobed spathe. Outer perianth-segments green, inner ones larger and petal-like. Stamens 6 or more; anthers linear. Styles or stigmas 6, 2-lobed. Ovary and fruit more or less completely 6-celled, with numerous ovules and seeds. — Submerged herbs, the radical leaves and peduncles in tufts at the bottom of the water. Leaves mostly or all bearing an oblong ovate or broad-cordate lamen.

The genus is spread over tropical Asia and Africa with one American species.

32. **Ottelia alismoides** (L.) Pers. Syn. Pl. I (1806), p. 400. — Boiss. Fl. Or. V, p. 5. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 143 no. 992. — *Stratiotes alismoides* L. Spec. Plant. I, p. 754. — Leaves on long petioles dilated and tufted at the bottom of the water, the lamina submerged or floating, orbicular-cordate and about 12 cm diameter in the Egyptian species. Peduncles usually long. Spathe ovoid-oblong, nearly 3 to 3.5 cm long, shortly 2-lobed at the top, and bearing 5 or 6 longitudinal herbaceous wings, 2 or 3 of them 1 to 2 cm broad, the others usually narrower. Ovary and fruit about the length of the spathe. Outer perianth-segments green, oblong-lanceolate, 4 to 5 cm long, inner ones white, veined under 2.5 cm diameter. Stamens 6 to 9.

N. d. In canals between Sherbin and Ras-el-Khalig; in ditches near Damietta; Lake Menzaleh; Rosetta; Kafr Zavat. — **O.** Little Oasis: Ain Walid; El-Ayun. —

Local name: widnet-esh-sheytân. — akûl-bishûm. — luqmet-el-qâdy.

The species is widely dispersed over East-India and Australia.

Glumiflorae.

Mostly perennial caulescent or acaulescent plants, commonly known as *Grasses* and *Sedges*. Stems (culms) simple or branched, mostly conspicuously jointed. Leaves alternate, mostly sheathing at the base, blades usually narrow and elongated, entire or nearly so. Flowers variously disposed in a simple or compound inflorescence, perfect, or rarely monoecious or dioecious, incomplete, inconspicuous, in the axils of chaffy bracts or scales (glumes). Fruit a caryopsis (grain) or an achene.

9. Gramineae.

Annual or perennial, erect or creeping herbs, rarely (bamboos) shrubby or arborescent. Stem (culm) branched at the base, cylindrical or slightly compressed, jointed, generally hollow between the joints; joints (nodes) solid, swollar. Leaves alternate, distichous, usually long and narrow, entire, parallel-veined; sheath long, usually split to the base on one side, at its junction with the blade usually furnished with an erect membranous appendage called the ligule. Flowers hermaphrodite or unisexual, minute, solitary in the axils of small bracts (glumes) which are imbricated in 2 opposite rows, forming little spikes or spikelets. Spikelets usually many, arranged in spikes, panicles, or fascicles. Glumes placed alternately on each side of the axis (rachilla) of the spikelet, the first or lowest 1—6 (commonly the first 2) empty and known as empty glumes or outer glumes,

or simply as glumes. The succeeding 1 or several are called flowering glumes, each of them having in its axilla very short branchlet bearing on its upper side a 2-nerved bractlet called the palea; the branchlet ending in a flower, which is thus enclosed by the flowering glume and palea. Occasionally 1 or more glumes at the top of the spikelet are empty or enclose rudimentary flowers only. Perianth wanting, unless represented by 2 (rarely 3) minute scales (lodicules). Stamens usually 3, rarely 1, 2, or 6, hypogynous; filaments capillary; anthers pendulous, versatile, fugacious. Ovary 1-celled; styles 2 or rarely 3, free or connate at the base, feathery with simple or branched stigmatic hairs; ovule solitary, erect, anatropous. Fruit a seed-like utricle or grain (caryopsis) either free within the flowering glume and palea, or adhering to one or both. Seed erect, usually adherent to the membranous pericarp, rarely separable (*Sporobolus*); albumen copious, farinaceous; embryo very small, roundish, on one side of the base of the albumen.

One of the largest of the families of plants, found in all climates and situations, but most numerous in temperate regions. Genera about 325; species probably not less than 4000. In usefulness to man it is exceeded by no other order. The nutritious herbage forms the chief pasturage of our flocks and herds; the cereal grains, as wheat, barley, rye, oats, rice, millet, maize, etc. constitute a very large proportion of our food; sugar is obtained from the sugarcane and sorghum; while few plants are applied to a greater variety of uses than the various kinds of bamboos. Many species are cultivated for ornamental purposes, from the dwarf varieties used for edgings and lawns to the pampas-grass and giant bamboo. A great deal of the Egyptian genera are widely distributed in either temperate or tropical regions or in both, and some are cosmopolitan. In addition to the indigenous species, a large number of grasses have become naturalised, and every year adds to the list. Most of these are natives of the Northern Hemisphere, and many have been purposely introduced and widely spread through the country on account of their value for pasturage or fodder. The remainder are either weeds of cultivation or inhabitants of waste-places or roadsides, a large proportion having followed the footsteps of civilized man all round the world. Many of the naturalized species have so completely amalgamated with the indigenous flora as to present all the appearance of true natives, and will certainly be taken as such by a beginner unacquainted with their history. It will therefore be advisable, when determining any species to make frequent reference to the list of naturalised species given in another part of this work, and to become acquainted with their distinguishing characters, which, with a majority of cases, can be learned from any British Flora.

A. *Panicoidae*. — Spikelets articulated on their pedicels below the glumes and falling away at maturity; sometimes 2-flowered, the upper flower perfect and producing seed, the lower flower often male or neuter; rhachilla not continued beyond the upper flower.

I. *Andropogoneae*. — Spikelets usually 1-flowered, generally in pairs, rarely in threes or solitary, on the rhachis of a spike or branches of a panicle, all hermaphrodite or some of them male, in the latter case so placed that a male spikelet stands by the side of a hermaphrodite one. Flowering glumes hyaline, often awned, usually much smaller than the empty ones.

a) Spikelets in a spike-like panicle, those of each pair unequally pedicelled. Branches of panicle not jointed 1. *Imperata*.

b) One spikelet of each pair or triplet sessile, the other pedicelled. Branches of panicle or axis of twin spikes more or less jointed 2. *Saccharum*.

c) One spikelet of each pair sessile, fertile, the other pedicelled, sterile, or O. Spikelets appressed to the rhachis, usually 2 at each hollow of the spike.

1. Spikelets appressed in stiff, linear spikes, clustered in axils of leaves, with a spathe-like sheath at the base of each spike 3. *Rottboellia*.

2. Spikelets in a hirsute, cylindrical, terminal spike 4. *Elionurus*.

d) Spikelets arranged along the rhachis of the spikes or branches of the panicle, one sessile, fertile, the other pedicelled, sterile. Flowering glume of perfect flower usually awned 5. *Andropogon*.

II. *Zoysieae*. — Spikelets usually 1-flowered, solitary or in clusters on the rhachis of a spike or raceme. Flowering glumes membranous, never awned, usually smaller than the empty glumes.

Empty glume of neuter flower 1, with
5—7, echinate ribs, and enclosing the
perfect flower

6. *Tragus*.

III. *Panicaceae*. — Spikelets with 1 upper
bisexual flower with or without a male
one below it. Flowering glumes awnless,
cartilaginous or coriaceous, in fruit hardened
and enclosing the grain. Empty glumes
thinner in texture than the flowering glumes,
rarely awned.

a) Empty glumes and flowering glumes
entire or caudate- or subulate-awned.
Fruiting glume subchartaceous or crus-
taceous.

1. Spikelets 1-flowered, plano-convex,
sessile in 2 or 4 rows in one-sided
spikes which are either in pairs or
form the branches of a simple panicle.
Empty glumes 2

7. *Paspalum*.

2. Spikelets with 1 bisexual flower and
sometimes a male flower below;
empty glumes, usually 2 or 3, not
awned, the lowest often very small

8. *Panicum*.

3. Spikelets enclosed, each one or
2—3 together, in an involucre of
rigid spines or bristles, often connate
into a cup below

1. Bristles thickened at base

9. *Cenchrus*.

2. Bristles not thickened at base

10. *Pennisetum*.

b) Empty glumes and flowering glumes
2-lobed or emarginate, with a fine awn
or mucro from the sinus, rarely all
muticous. Fruiting glume rigidly mem-
branous

11. *Tricholaena*.

IV. *Oryzeae*. — Spikelets (in ours) with one,
perfect flower, usually small, panicle or
simply spiked, the flowering axis not jointed.

1. Spikelets panicle

12. *Oryza*.

2. Spikelets 2 to 3 in a spathe

13. *Lygeum*.

B. *Poaeoideae*. — Spikelets not articulated on the
pedicel below the glumes, the rhachilla
continuous with the pedicel, and the articula-
tions above the empty glumes and frequently
also between the flowering glumes. Flowers

1 to many, the lowest flower perfect, the uppermost often male or imperfect. (Lower flower imperfect in Phalarideae.)

I. Phalarideae. — Spikelets with 1 upper bisexual flower, with or without 1 or 2 male or rudimentary flowers below. Outer glumes 4, the lower 2 sometimes small, the 2 inner sometimes serving as flowering glumes for male flowers.

Glumes nearly equal, usually winged.

Inflorescence an oblong spike or dense panicle

14. *Phalaris*.

II. Agrostideae. — Spikelets 1 flowered; rachilla frequently produced beyond the flower. Empty glumes 2, usually as long or longer than the flowering glume.

a) Spikelets loosely paniced, the axis not produced beyond the flower. Flowering glumes awned.

1. Flowering glume 3-awned; flower stipitate

15. *Aristida*.

2. Flowering glume 1-awned; flower stipitate

α) Awns persistent 16. *Stipa*.

β) Awns very caducous 17. *Oryzopsis*.

b) Spikelets in a cylindrical or ovate to oblong spike, the axis beyond the flower naked, or produced into a short bristle. Flowering glumes muticous

18. *Heleocholea*.

c) Spikelets small, in a compact panicle or slender spike, the axis not produced beyond the flower; empty and flowering glumes not awned

19. *Sporobolus*.

d) Spikelets small, more or less densely paniced, or in ovate to oblong heads. Flowering glumes awned or rarely muticous

1. Spikelets more or less densely paniced

α) Rachilla not produced beyond the flower

† Panicle spike-like. Glumes awned

20. *Polypogon*.

†† Panicle loose 21. *Agrostis*.

- β) Rhachilla produced beyond the flower, silky
 † Tall herbs 22. *Calamagrostis*.
 †† Small herbs 23. *Triplachne*.
2. Spikelets in ovate to oblong heads 24. *Lagurus*.
- e) Spikelets laterally compressed, in dense heads or short spikes
1. Glumes nearly equal, not winged. Inflorescence a dense head or short spike, with an involucre of upper leaves 25. *Crypsis*.
2. Glumes nearly equal, keeled. Inflorescence on ovate or globular head or a cylindrical spike, without involucre 26. *Alopecurus*.
- III. *Aveneae*. — Spikelets 2-or several-flowered, usually paniced. Flowering glumes generally shorter than the empty glumes, usually awned; awn geniculate and often twisted, rarely straight.
- a) Awn of the flowering glumes dorsal, rising from below the terminal teeth of the glume, not from between them.
1. Glumes muticous. Awn of the flowering glume club-shaped at the tip 27. *Corynephorus*.
2. Flowering glumes sharply 2-toothed at the tip; teeth sometimes almost awned; awn from the back just below the teeth.
- α) Spikelets small, panicles compact spike-like or loose. Grain not grooved, glabrous 28. *Trisetum*.
- β) Spikelets large, on capillary or thickened pedicels, panicle loose, or compact spike-like. Grain grooved, hairy 29. *Avena*.
- b) Awn of the flowering glumes rising from between the terminal lobes or teeth of the glume 30. *Danthonia*.
- IV. *Chlorideae*. — Spikelets 1-many-flowered, crowded in two rows on one side of a flat rhachis or spike; spikes in racemes or digitate.

- a) Flowers several, one bisexual.
 - 1. No barren or male flower above the bisexual flower.
 - α) Spikes digitate. Spikelets awnless 31. *Cynodon*.
 - β) Spikes subdigitate. Spikelets awned 32. *Schoenefeldia*.
 - 2. 1 or several barren flowers above the bisexual flower 33. *Chloris*.
 - b) Several to many bisexual flowers in each spikelet.
 - 1. Spikes solitary or rarely 2—3, erect 34. *Tetrapogon*.
 - 2. Spikes numerous, short and expanding 35. *Dinebra*.
 - 3. Spikes digitate
 - α) Spikes terminated by a spikelet 36. *Eleusine*.
 - β) Point of the rhachis of the spikes naked, projecting 37. *Dactyloctenium*.
- V. *Festuceae*. — Spikelets 2 — many-flowered, usually panicle or racemed. Flowering glumes generally exceeding the empty glumes, awnless or with 1 or several straight awns, which are usually terminal, rarely dorsal. Rhachilla produced beyond the uppermost flower.
- a) Spikelets 5—6-flowered. Flowering glumes ∞ -nerved, 7—9-awned.
 - 1. Spikelets in dense panicles.
 - α) Flowering glumes with 9 awns excurrent from nerves 38. *Pappophorum*.
 - β) Flowering glumes with 7—9 awns at the base of the hyaline tip . 39. *Boissiera*.
 - 2. Spikelets in loose panicles 40. *Schmidtia*.
 - b) Spikelets 3— ∞ -flowered. Flowering glumes 3-toothed or cleft 41. *Diplachne*.
 - c) Spikelets 2— ∞ -flowered, the axis under the flowering glumes, and often the glumes themselves, long hairy.
 - 1. Flowering glumes 2-cleft at the tip, with an awn at sinus. All the flowers except the uppermost fertile. Glumes equal 42. *Arundo*.
 - 2. Flowering glumes acuminate awned. Lower flower staminate or neuter. Glumes unequal 43. *Phragmites*.

- d) Spikelets in spikes or heads, often with an involucre of sterile glumes or spikelets.
1. Heads globular to oblong; spikelets 2-ranked; glumes with a keel to one side 44. *Ammochloa*.
 2. Heads ovate.
 - α) Fertile spikelets 2-flowered, sterile oblong, composed of ovate, obtuse, 2-ranked glumes; branches of panicle and spikelets nodding, loose 45. *Lamarckia*.
 - β) Fertile spikelets 2—5-flowered, sterile ovate to oblong, composed of 2-ranked, or somewhat spirally arranged, long awned glumes. Spikelets in ovate to oblong heads 46. *Cynosurus*.
- e) Spikelets variously paniced or spiked, or in heads, destitute of an involucre. Flowering glumes muticous, or awned at or beneath the tip.
1. Spikelets in cylindrical, branched, often lobed spikes 47. *Koeleria*.
 2. Spikelets in long, diffuse, panicles, with capillary, 2—3 forked branches. Pedicels club-shaped, crowned with persistent glumes 48. *Sphenopus*.
 3. Spikelets 3—∞-flowered, imbricated, in diffuse panicles or spikes; axis and empty glumes persistent; flowering glumes falling with the grain 49. *Eragrostis*.
 4. Spikelets in globular, ovate, oblong or oblong-cylindrical heads. Low plants, with rigid, 2 ranked leaves 50. *Aeluropus*.
 5. Spikelets in ovate to oblong, very dense, compound spikes or heads 51. *Dactylis*.
 6. Spikelets in a short, dense, spike-like panicle. Flowering glumes 2-toothed or-lobed, with or without awn 52. *Schismus*.
 7. Spikelets ovate to ovate-oblong, with more or less imbricated flowers, in more or less open panicles. Upper glumes muticous 53. *Poa*.
 8. Spikelets oblong, glumes muticous, flowering glumes muticous or short-awned 54. *Festuca*.

9. Spikelets in loose panicles, one-sided or forked. Spikelets muticous, mucronulate or aristulate 55. *Scleropoa*.
 10. Spikelets ∞ -flowered, large awned in various panicles 56. *Bromus*.
 11. Spikelets ∞ -flowered in panicles reduced to a raceme of 2-ranked, more or less approximated 57. *Brachypodium*.
- VI. *Hordeae*. — Spikelets 1-many flowered, sessile in alternate notches on opposite sides of the rhachis of a simple spike, either solitary or several together. Glumes awned or not.
- a) Spikelets solitary at nodes, 3—2— ∞ -flowered. Spikes thick.
 1. Spikelets edgewise to axis, lodged in an excavation. Glume 1 58. *Lolium*.
 2. Spikelets at teeth of the axis, parallel to it. Glumes 2.
 - α) Spikelets ∞ -flowered. Glumes not subulate-awned, nor ventricose at the base. Nerves of flowering glumes connivent at the tip . . . 59. *Agropyrum*.
 - β) Spikelets 3—5-flowered. Empty glumes and flowering glumes ventricose at the base, keeled. Nerves of the flowering glumes not connivent at the tip 60. *Triticum*.
 - γ) Spikelets 3— ∞ -flowered. Empty and flowering glumes convex, not keeled, ∞ -nerved, nerves not connivent at the tip 61. *Aegilops*.
 - b) Spikelets solitary at nodes, 1—2-flowered. Spikes slender 62. *Lepturus*.
 - c) Spikelets 2—3, side by side as teeth of rhachis. Spikes thick.
 1. Spikelets 3 at each joint, 1-flower, with a rudiment of a second flower, the lateral spikelet staminate or neuter, the intermediate fertile . . 63. *Hordeum*.
 2. Spikelets 2 at each joint, sessile, fertile (ours), 1-flowered, with a rudimentary second flower 64. *Elymus*.

18. (1.) **Imperata** Cyr.

Panicles long, terminal, densely spiciform or narrow-thyriform, silky-silvery. Spikelets all similar, numerous, densely clothed with long silky hairs, usually arranged in pairs on the continuous branches of the panicle, one sessile or almost so, the other distinctly stalked, all-1-flowered. Empty glumes 3, subequal, narrow, membranous, awnless, 3—9-nerved, the 2 outer clothed with long hairs. Flowering glume usually much smaller, hyaline. Palea small, broad, hyaline nerveless. Lodicules wanting. Stamens 1 or 2. Stigma long, exerted from the tip of the spikelet. Grain oblong, with an embryo half its length or more. Tall and erect grasses; leaves long.

A genus of about 6 species, found in tropical or warm temperate regions of both hemispheres. The Egyptian species is very widely diffused.

33. **Imperata cylindrica** (L.) P. Beauv. Essai agr. (1812), p. 165 tab. 5. — Boiss. Fl. Or. V, p. 452. — Aschers.-Schweinf. III. Fl. d'Eg., p. 162 no 1138. — *Lagurus cylindricus* L. Syst. veg. ed. X (1759), p. 878. — Culms 10—90 cm high, slender, erect, glabrous 3—4-noded. Leaves erect, narrow, rarely exceeding the culms; sheaths rather looser, with a dense erect tuft of hairs at the nodes; ligules short, membranous, truncate; lamina linear from a very narrow base, acuminate, rather rigid, flat or convolute; margins scabrid; midrib stout. Panicle densely spiciform 1—2 dm long, cylindric, obtuse, silvery-white and shining from the long and silky hairs which conceal the glumes; branchlets very numerous, appressed; pedicels capillary or setaceous, clavate at the tip. Spikelets about 1—2 mm long, completely envelopped by fine silky hairs 2—5 mm long. Empty glumes ovate-lanceolate, obtuse or subacute, hyaline, 5—7-nerved or the uppermost nerveless. Flowering glume $\frac{1}{3}$ — $\frac{1}{2}$ as long as the upper empty glume, ovate, acute, glabrous, hyaline, nerveless. Palea about $\frac{1}{2}$ as long as the glume, quadrate, truncate, nerveless. Stamens 2. Stigmas long, purple. — Flow. Februar to March. —

M. ma. Alexandria. — **M. p.** Damietta; Port Said. — **N. d.** Rosetta; Mansura; Ismailia; Fayid, between Suez and Ismailia; Cairo; Helwan. — **N. f.** Fayûm. — **N. v.** Between Siut and El Homra. — **O.** Great Oasis: 'Ain Abdallah Koshef; 'Ain Khenafes; near Djenah; Little Oasis; 'Ain Me'allagah; Farâfra; Dakhel. — **D. i.** Pyramids of Gîza. — **D. i.** Suez, fresh water canal. — **D. a. sept.** Wady-Gemal. Wady-et-Tin. — Characteristic for the embarkments of the canals. —

Local name: sill; bu-dueys; halfâ (at Damietta).

The species, in some of its forms, is found in all warm countries. The different varieties and the type, although on the whole pretty distinct with in

their areas often pass into each other, chiefly along the confines of their areas, or they seem to lose their distinctive characters under particular local conditions, when their separation becomes almost impossible.

19. (2.) **Saccharum** Linn.

Spikelets all alike or at least similar, usually 2-nate (one sessile, the other pedicelled, rarely both pedicelled) on the articulate, usually fragile, rhachis of panicled spiciform racemes, the pedicelled falling from their pedicells, the sessile deciduous together with the continuous joint of the rhachis and pedicel. Flowers 2, the lower reduced to an empty glume; upper male or sometimes female in the pedicelled spikelets, which are then slightly smaller. Glumes equal, membranous to coriaceous; flowering with inflexed margins and, in the sessile spikelet, with an even number of nerves: empty 1—3—5-nerved. Upper glumes hyaline, mucous or mucronate, upper smaller or 0. Lodicules 2, cuneate. Stamens 3. Stigmas laterally exerted. Grain oblong to subglobose; embryo half the length of the grain or more; hilum basal. — Perennial, often very tall; leaves various; panicle large often silky and showy, much and densely branched, or contracted to spiciform; spikelets often surrounded by long silky hairs from the base.

Species about 14, tropical or subtropical.

34. **Saccharum biflorum** Forsk. Flor. aeg.-arab. p. 16 (1775) no. 30. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 163 no. 1139. — *S. aegyptiacum* Willd. Enum. pl., p. 82. — Boiss. Fl. Or. V, p. 454. — Culms terete, 1 cm in diameter at the base, solid, appressed silky above. Leaves glaucescent, rigid, linear, 0.5—1 cm broad, acuminate, grooved-keeled, with a stout midrib, serrulate at margin. Panicle 5 to 6 cm long, 1 to 2 cm broad, lanceolate, axis and nearly erect branches villous-silky; base of spikelets with an involucre consisting of a ring of hairs twice as long as the spikelet; glumes pale-purplish, oblong-lanceolate, acuminate, margin long-ciliate; pales shorter than glumes, with shorter ciliae. — February to March.

M. ma. Alexandria. — **M. p.** Damietta, very abundantly; on hills near Rosetta. — **N. d.** Cairo; Helwan. — **N. f.** bords of the bahr Tundûd near Medinet-el-Fajûm. — **N. v.** Akhmîm; Isle Hassanarti near Aswân. — **O.** Great Oasis. — **D. a. mer.** Qoseyr.

Local name: ganîsh; bûs-fârîsy; bûs-el-gesâ'a; qalâm; bûs; bûs giddâwi (Rosetta) qamneysh, anneysh (Damietta), helleyu (Aswân).

The species is also found in Syria, Palestine, and Sinai.

20. (3.) **Rottboellia** Linn. f.

Spikelets all alike, or more or less heteromorphous, 2-nate, rarely 3-nate (one, rarely 2, sessile, the other pedicelled and sometimes rudimentary, with the pedicel free and appressed or adnate to the contiguous joint, whence the spikelets appear to be in true spikes), on the articulate and usually fragile rhachis of solitary, digitate or paniced, spike-like racemes, the sessile usually deciduous with the contiguous joint of the rhachis. Flowers 2; lower male or barren; upper bisexual, or male in the pedicelled spikelets, or the latter quite barren or rudimentary. Glumes equal or subequal; lower more or less coriaceous, at least along the 2 keels, dorsally flattened or subconvex, muticous, obtuse, rarely acuminate; upper chartaceous to membranous, muticous. Flowering glumes hyaline or the lower membranous, muticous. Pales almost equalling their glumes, hyaline or obsolete. Lodicules 2. cuneate. Stamens 3. Stigmas generally laterally exerted. Grain broadly oblong; embryo $\frac{1}{2}$ the length of, or almost as long as, the grain. — Perennial or annual, of various habit.

Species about 35 in both hemispheres.

The only Egyptian species belongs to the subgenus *Hemarthria* Hackel, characterized by solitary spikes, terminal on the culms or their branches, compressed, tardily or not all disarticulating; joint tips truncate, not hollowed; spikelets all alike in form or nearly so; lower flower reduced to an empty glume.

35. **Rottboellia compressa** Linn. f. Suppl. 114 var. **fasciculata** Hack. Androp. in DC. Monogr. Phan. vi. 286. — *Hemarthria fasciculata* Knuth Rev. Gram. I, p. 153. — Boiss. Fl. Or. V, p. 465. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 166 no. 1147. — Perennial; culms erect from a decumbent rooting base, branched, 30 cm—1.5 m long, compressed, glabrous; sheaths shorter than the internodes, compressed, keeled, often ciliate at the mouth, otherwise glabrous; ligules membranous, very short, ciliate; blades linear, gradually tapering, acute, very variable in length and width, uppermost almost suppressed, somewhat rigid, glabrous; racemes often fascicled, rather stout, straight or curved, with the appearance of true spikes owing to the pedicels of the upper spikelets being adnate to the contiguous joint, more or less fragile; spikelets linear-oblong to oblong, 6–8 mm long, glabrous; glumes equal, lower coriaceous, constricted below the obtuse tips or in the pedicelled spikelets more acuminate, finely 7–9-nerved, upper broadly lanceolate, acuminate, membranous and 3-nerved in the sessile, subchartaceous and 5–7-nerved in the pedicelled spikelets; flowering glumes subequal, nerveless, 4–6 mm long;

pale linear. 2.5—4 mm long; anthers 2.5—3 mm long. — Flow. July to August.

N. d. Lake Menzaleh; Damietta; Morabaine; Khanka. —

Local name: sommeyr (Schweinf.).

Throughout the warm countries of both hemispheres, in many localities evidently introduced. The type through India to South-west China.

21. (4.) *Elionurus* Humb. and Bonpl.

Spikelets similar, usually awnless, but differing in sex, 2-nate (one sessile, the other pedicelled) on the articulate fragile rhachis of solitary spike like-racemes, the sessile deciduous with the contiguous joint of the rhachis and the pedicel. Flowers 2; lower reduced to an empty glume; upper bisexual in the sessile, male, rarely barren, in the pedicelled spikelet. Glumes equal; flowering subcoriaceous to herbaceous, often 2-toothed or 2-fid, rarely awned, dorsally flattened, 2-keeled, usually with fine, filiform, transparent oil glands close to the ciliate or penicillate keels; empty membranous, lanceolate, acute, rarely awned. Pales hyaline, awnless. Lodicules 2 cuneate. Stamens 3. Stigmas laterally exserted. Grain oblong, dorsally compressed; embryo about $\frac{1}{2}$ the length of the grain. — Generally perennial, caespitose, aromatic; blades flat or folded; ligules membranous, very short; racemes erect, joints strongly compressed, usually villous, tips oblique, not appendaged.

Species about 15, in the tropics and the subtropical regions of both hemispheres.

36. *Elionurus hirsutus* (Forsk.) Munro ex Benth. in Linn. Soc. XIX (1881), p. 68. — Boiss. Fl. Or. V, p. 466. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 166 no. 1146. — rootstock indurated, furnished with stout fibres; culms erect, woody below, branching; sheaths with dilated, bearded mouth, lamina linear, acuminate, convolute. Spike 1 to 5 cm long, 1 cm broad, silvery-silky; rhachis brittle; flowering glume larger, sometimes bifid at the tip. — Flow. April.

D. i. Tell-el-kebir on sand hills, growing in the loose sand near Suez. — **D. a. sept.** Gebel ahmar; Moqattam and Petrified Forest near Cairo; sandy deserts near Helwan.

Local name: sammât. (Schweinf.-Muschler).

Also found in Palestine, Syria, Sinai.

22. (4.) *Andropogon* Linn.

Spikelets similar or heteromorphous, 2-nate (one sessile, the other pedicelled) on the fragile rhachis of solitary, 2-nate, digitate,

fascicled or panicle. spike-like racemes, the sessile deciduous with the contiguous joint off the rhachis and the pedicel. Flowers 2; lower reduced to an empty glume; upper bisexual in the sessile, male or barren, or quite suppressed in the pedicelled spikelet. Glumes equal or subequal; flowering coriaceous to subchartaceous, 2-keeled, muticous; outer usually less firm, with a median keel, muticous, rarely with a terminal bristle. Pales hyaline, the upper at least so at the base, and usually awned. Lodicules 2, cuneate. Stamens 3—1. Stigmas laterally exerted. Grain various. — Perennial or annual, of very varied habit.

Over 200 species in the warm parts of the world.

A. Sessile spikelets of all the pairs alike in sex and form.

I. Perennial; rhachis of raceme fragile 1. **A. halepensis.**

II. Annual; rhachis of raceme tough 2. **A. Sorghum.**

B. Sessile spikelets of the lowest 1 or more pairs, differing from those above in sex or form (if the racemes are 2-nate, this is the case at least in one of the racemes).

I. Spikes solitary at the apex of culm or its branches, linear 3. **A. foveolatus.**

II. Spikes numerous, terminal, clustered or digitate, not bracted 4. **A. annulatus.**

III. Spikes paniculate, each pair subtended by a spathe-like bract

a. Leaves linear 5. **A. hirtus.**

b. Leaves filiform 6. **A. laniger.**

37. (1.) **Andropogon halepensis** Brot. Fl. Lusit. I (1804), p. 89. — Boiss. Fl. Or. V, p. 459. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 165 no. 1141. — Perennial; culms erect usually very tall, up to 1—1,5 m long, simply or scantily branched; sheaths glabrous, except the minutely silky nodes, strongly striate; ligules membranous, short, ciliate, hairy inside; blades linear-lanceolate or linear from an often rounded base, long tapering to a fine point, 2 dm long, 2,5 cm broad, flat, glabrous, or with a silky line on the back at the union with the sheath, margins serrulate, midrib stout; panicle decompound, very large up to 2 dm long, effuse, nodding, lower branches up to 1,5 cm long, often undivided to the middle; rhachis and branches or at least the ultimate branchlets scabrid and minutely bearded at the nodes; racemes 1—2 cm long, linear; joints 3—7, more than half as long as the sessile spikelets, more or less ciliate, pedicels very similar; flowering glumes more or less hairy, at last on the sides, 7—13-nerved, callus shortly bearded; outer lanceolate, acuminate. — Flow. April.

M. ma. Alexandria. — **N. d.** Damietta; Damanhur. — Between Cairo and Keneh near Gebel Migar. — **N. f.** Medînet-el-Fajûm. — **N. v.** Siut; Erment; Esneh; Khannbiye; Philae and Cataract; near Kom-Ombo, bord of the Nile. — **O.** Great Oasis, Khargeh, Ain Taûil, Gjau. Little Oasis; Farâfrah; Dakhel. — Everywhere on the margins of irrigation-cannals. Collected largely for fodder.

Local name: hashish-el-faras; generally gerrâu.

Throughout the tropics, but particularly in Africa.

38. (2.) **Andropogon Sorghum** Brot. Fl. Lus. I (1804). p. 88. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 163 no. 1140. — Annual; leaves as in *A. halepensis*, but the ligule often glabrous or glabrescent; panicle very variable, from effuse to compact; rachis of racemes tough; joints and pedicells half as long as the sessile spikelets or very often much shorter, more or less ciliate: sessile spikelets very variable in shape and size, on the whole broader than in *A. halepensis*. 5—7 mm by 2.5—5 mm, pale, reddish, brown or at length black, usually shining; flowering glumes coriaceous, or more or less herbaceous, particularly towards the tips, rarely quite thin except at the base, often prominently nerved in the herbaceous part, hairy, rarely quite glabrous, otherwise as in *A. halepensis*, awn 6 mm to 12 mm long, more or less reduced or 0; grain obovate to globose; pedicelled spikelets male or more frequently barren and more or less reduced. — Flow. April to May.

N. d. N. f. N. v. Sometimes spontaneous.

Local name: dokhn, dura, dura-belledi. —

Cultivated in numberless forms in the tropical and subtropical regions, particularly in the Old World, and in the warmer parts of the temperate zones of both hemispheres. A great many varieties have been described; of these 8 are said to occur in Egypt.

39. (3.) **Andropogon foveolatus** Del. Fl. Eg. (1823). p. 16 tab. 8 fig. 2. — Boiss. Fl. Or. V. p. 462. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 166 no. 1142. — *A. monostachyus* Spr. Pug. II, p. 9. 30 to 40 cm high; glaucescent, tufted; root fibrous; culms erect or ascending, leafy, hirtulous at nodes, simple or branching. Leaves sparingly ciliate at lower part of margins and mouth of sheath. Spikes 4 to 5 cm long, 3 mm broad (without awns); spikelets 2-ranked; rachis and pedicels white-hairy, shorter than spikelet; lower flower of spikelets neuter, reduced to a membranous glume; glumes of perfect spikelet short-ciliate at tip, with a pit on dorsal aspect below the tip; flowering glume reduced to a long, slender, bent and twisted awn; outer glume obsolete; pales of staminate or neuter flowers usually 0 — Flow. April.

D. a. sept. Moqattam: Gebel ahmar near Cairo; Wady-Turra; Wady-Hof, Wady Rished near Helwan; Suez. — **D. a. mer:** Wady Khafura and Shatraf; Wady-Hamâta. Qoseyr: Ras Mreyk. Ras Humra, Sherem Lulia.

Also known from Palestine, Syria, Sinai, Arabia and Erythraea.

40. (4.) **Andropogon annulatus** Forsk. Fl. aeg.-arab. (1775), p. 173. — Del. Fl. Eg. (1813), p. 16, Tab. VII, Fig. 2. — Boiss. Fl. Or. V, p. 463. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 166 f. no. 1143. — Perennial, caespitose; stem erect or ascending, simple, rarely with 1—2 flowering branches from the upper nodes, 90 cm long; sheaths terete or obscurely keeled above, tight, glabrous except the bearded nodes, margins sometimes ciliate above; ligules 2.5—5 mm long, obtuse glabrous; blades linear, tapering to a long fine point, 2—10 cm by 5—7 mm, rigid, glaucous, scabrid, glabrous or with tubercle-based hairs; racemes 5—7, rarely fewer, or solitary, or many, slender 2.5—7 cm long, rather flaccid, pale or purplish, peduncles short, glabrous, joints and pedicels about half the length of the spikelets, ciliate; all sessile spikelets hermaphrodite, or the lowest one like the pedicelled and male; hermaphrodite spikelets oblong, 2.5—5 mm long, callus minute; flowering glume very obtuse, concave, usually more or less hairy all over the back, with tubercle-based hairs, intracarpal nerves 5—9, evanescent below the tip, keels spinously ciliate; outer lanceolate; pedicelled spikelets hairy all over, flatter than the hermaphrodite; flowering glume usually long, ciliate all along the margins, 7—11-nerved. — Flow. April.

N. d. N. f. N. v. O. D. a. sept. D. a. mer: Common in the fields and in gray soil and most characteristic of that country, and also in cultivated ground, and along the banks of irrigation-canals.

Local name: sifün (Aschers.-Muschler) — rukeyb (Schweinf.). Throughout the tropics of the old World.

41. (5.) **Andropogon hirtus** L. Spec. Plant. I (1753), p. 1482. — Boiss. Fl. Or. V, p. 464. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 166 no. 1144. — Sickberg. Contrib. Fl. d'Eg., p. 302 no. 1144. — 40 to 100 cm high; tufted; roots fibrous, culms branching above. Leaves scabrous at margin, glaucescent. Branches 1—3, clustered in upper axils; spikes in pairs, somewhat nodding, oblong, 2 cm long, 5 mm broad, flattened, rachis and pedicels densely hairy; glumes of perfect spikelets equal, obtuse, the flowering ∞ -nerved, densely hairy, the outer glabrous or sparsely hairy, acutish; awn geniculate, twisted, pubescent, 4-times as long as the linear, 2-dentate, hyaline pale; glumes of staminate spikelet more acute; pale awnless.

N. v. Massara near Helwan.

This species is very common throughout the Mediterranean region.

— var. **pubescens** Vis. Fl. Dalm. Suppl. I (1881). p. 14. — Boiss. Fl. Or. V. p. 465. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 166 no. 1144. — Leaves narrower; spikes fewer, more slender, with shorter appressed hairs; awn 5—6 times as long as the pale.

M. ma. Mariut. — **D. a. sept.** Abu Zabel; Wady-Hof; Wady Rished; Wady Azhar; Wady Natfe; Suez. Galala.

Local name: hemar.

Also known from all the Mediterranean region.

42. (6.) **Andropogon laniger** Desf. Flor. Atl. II (1798). p. 379. — Boiss. Fl. Or. V. p. 465. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 166 no. 1145. — Perennial, tufted; innovation shoots mostly intravaginal; culms erect, rather slender, 30 to 70 cm long, glabrous, simple or more or less branched and 3—6-noded below the panicle, longest internode generally less than 10 cm long; sheaths tight, glabrous, the lowest crowded, compressed, firm, persistent, the upper terete, shorter than the internodes; ligules oblong, obtuse, up to 2.5 mm long; leaves narrow, linear, filiforme tapering to a long fine point, 8 cm to more than 15 cm by 2.5 to 5 mm, glabrous, finely scaberulous, more or less glaucous, turning reddish, midrib white; panicle spathaceous, lax contracted, sometimes reduced to a few simple branches, 15 to more than 20 cm long; racemes 2.5 to 3 mm long, silvery villous, on very slender, usually nodding, pubescent or villous, rarely glabrous peduncles, which are 2.5 to 7.5 mm long, and more or less exerted from the long very narrow finely acuminate glabrous or scantily hairy reddish spathes; joints filiform, obliquely truncate; spikelets of the lowest pair of the sessile raceme alike, male, the sessile of all the other pairs hermaphrodite, the pedicelled male.

D. a. sept. „Le Caire“ Bozé ex Coss. et Dur. in Bull. Soc. Bot. France I (1854). p. 316. — I did not see a specimen from this locality.

Also known from the other parts of North Africa, common in the Egyptian Sudan. Known by the drogists of Cairo under the name of el-mahareb.

23. (5.) **Tragus** Hall.

Spikelets sessile, in deciduous clusters of 2–4 on the filiform continuous axis of a cylindric, spike-like panicle; rhachilla tough, not continued beyond the flower. Flower 1, bisexual, somewhat shorter than the upper glume. Glumes very dissimilar, lowest facing the rhachis, minute, hyaline, or suppressed, outer 5-ribbed or 5 nerved, membranous between the hispid or spine-hooked ribs or nerves, exceeding the flowering glume. Flowering glume

lanceolate or lanceolate-oblong, membranous, 3-nerved. Pale as long as the glume, 2-nerved. Lodicules 2, broad, cuneate, fleshy. Stamens 3. Styles distinct, very slender; stigmas narrow, plumose, terminally exserted. Grain enclosed by the glume and pale, oblong to ellipsoid, slightly compressed from the back; embryo about $\frac{1}{3}$ the length of the grain; hilum punctiform basal. — Annual or perennial; culms erect, ascending or decumbent; leaves linear, rather rigid with cartilaginous spinulously ciliate margins; ligules reduced to a delicate ciliate rim; panicles cylindric, slender; all the spikelets of a cluster fertile, or often 1 more or less reduced.

Species 2; one in South Africa, the other throughout the warm parts of both hemispheres.

43. ***Tragus racemosus*** All. Fl. Pedem. II (1785). p. 241. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 162 no. 1136. — T. Berteronianus Schult. Mant. II, p. 205. — *Cenchrus racemosus* L. Spec. Plant. I, p. 1049. — Annual or subperennial; culms fascicled, simple or branched with the branches often fascicled and densely leafy, geniculate ascending often from a decumbent base or wholly decumbent, slender, from a few cm to 130 cm long, glabrous or pubescent near the panicle, smooth, 3—5-noded, intermediate internodes exserted, uppermost 1 or 2 usually enclosed, and from less than 2,5 to 10 cm long; lowest sheaths short, broad, pallid, the following more or less herbaceous, rather loose, uppermost tumid, usually embracing the base of the panicle; leaves linear to lanceolate, acute 1 to 5 cm by 2,5 to 5 mm, flat or wavy, rigid very glaucous, closely striate; panicle 2,5—10 cm long, slender; axis straight or slightly wavy, pubescent; branches very close or the lowest distant, very short, 2—3 spiculate, sometimes minutely continued beyond the uppermost spikelets; spikelets facing each other when paired, 3—6 mm long, one of a cluster often reduced; lowest glume very minute, up to 1 mm long, hyaline, ciliolate or quite suppressed; outer glume slightly curved, involute, completely enveloping the flower, strongly 5-ribbed, thin between the ribs, these with rows of stout hooked spines; flowering glume membranous, very minutely pubescent, faintly 3-nerved; pale subacute, obscurely 2-nerved; anthers ellipsoid 0,25—0,75 mm long; grain oblong to obovoid-ellipsoid, subterete 1,27 mm long.

D. a. mer: Wadi-Etit near the Red-Sea-coast, 25° lat. N.

Also found throughout most warm regions.

The figure in Beauvois Agrost p. 23 Tab. VI Fig. 13 represents the anthers as linear and as long as in *Tragus koelerioides*; but this is evidently an error.

24. (7.) **Paspalum** Linn.

Spikelets orbicular to oblong, obtuse, rarely acute or acuminate falling entire from the very short or obscure pedicels, secund and usually 2-ranked on the flattened or triquetrous rachis of false spikes, plano-convex; lower flower barren, reduced to the empty glume, rarely with a rudimentary pale, upper flower bisexual. Flowering glume very minute, outer membranous, as long as the empty, rarely shorter or obsolete, usually with 1—2 submarginal side-nerves on each side, with or without a middle-nerve, rarely nerveless. Glumes equal or subequal, lower resembling the outer glume, usually 3—5, rarely 7-nerved, with the side-nerves curved, close, mostly submarginal and distant from the middle-nerve, when present, upper chartaceous to subcoriaceous, faintly 5—7-nerved. Pale subequal to and of the same texture as the glume, 2-nerved. Lodicules 2, cuneate. Stamens 3. Styles distinct, slender, stigmas laterally exerted near the tip of the flower. Grain tightly enclosed by the slightly hardened glume and pale, dorsally subcompressed; hilum basal, punctiform; embryo less than half the length of the grain. — Perennial or annual, of various habit; false spikes solitary, 2-nate, digitate or panicle; pedicells usually very short and adnate to the dilated rachis; spikelets imbricate or contiguous, rarely distant, solitary on sometimes 2-nate.

Species about 160, scattered through the tropics of both hemispheres, but most abundant in America. The Egyptian species is introduced from America.

44. **Paspalum Digitaria** Poir. Encycl. Suppl. IV (1816), p. 316. — *P. vaginatum* Sw. Fl. Ind. I. p. 135. — Perennial, rhizome long, branched, creeping and rooting. Culms erect or ascending, sheathed throughout by the leaves, glabrous, 12—50 cm high. Leaves numerous, 4—12 cm long, 1—1.5 mm broad, flat, glabrous or sparingly hairy towards the base; ligules short, membranous, truncate; sheaths compressed, striate, margins pilose above. Spikes rather slender 2.5—5 cm long, usually 2 but sometimes 3 or even 4, the lateral ones sessile or nearly so; rachis flat, margins scabrid. Spikelets in 2 rows, nearly sessile, imbricate and appressed to the rachis, ovate-oblong, acute, flattened, pale-green. Empty glumes equal, acute, membranous, pubescent or glabrous; the lower one 3-nerved; the upper 5-nerved, sometimes an additional minute empty glume is present at the base of the spikelet. Flowering glume coriaceous, smooth, shining, faintly nerved. Palea smaller coriaceous, margins inflexed but no auricled.

N. d. Zaqaziq, abundant.

Of American origin, introduced in Southern Europe, India, Australia and New-Zealand but very rare. It is a common plant in many parts of America, from Virginia southward.

25. (8.) *Panicum* Linn.

Spikelets lanceolate to ovate or broadly oblong, rarely globose. acuminate or acute or obtuse, articulate on the pedicel, laxly or densely paniculate, or very shortly pedicelled along one side of slender simple or branched spikes, seldom awned, glabrous or pubescent, sometimes with bristles or spines at the base, with a single terminal hermaphrodite flower, sometimes with a male one below it. Glumes 4; the lowermost small, sometimes minute, empty; second and third unequal or subequal, membranous, awnless or rarely awned, empty or the third containing a male or rudimentary flower; the fourth or flowering glume shorter or as long as the third, firmer and more coriaceous, hardening in fruit. Palea like the flowering glume but smaller, 2-nerved. Lodicules 2. Grain enclosed in the hardened flowering glume and palea, oblong or ellipsoid; hilum punctiform. Annual or perennial grasses, of very various habit.

As characterized above, this is a heterogeneous assemblage of about 300 species, found in all warm climates, but rare or absent in temperate countries.

A. Spikelets not involucrate, nor the pedicels
bristle-bearing.

I. Spikelets arranged along one side of digitate spikes, in pairs, one sessile and one pedicelled. Lower glume small or obsolete, upper pale of neutral flower O.

1. *P. sanguinale*.

II. Spikelets in 4 rows or irregularly arranged on secondary spike-like branches of the panicle. Lower glume of staminate flower often awned.

a) Glumes more or less mucronate-awned

2. *P. Crus galli*.

b) Glumes not awned

3. *P. colonum*.

III. Spikelets two-ranked, on the spike-like, one-sided, appressed branches of a simple, terminal panicle. Glumes not awned

a) Leaves ovate-lanceolate

4. *P. prostratum*.

b) Leaves linear-lanceolate.

1. Leaves glaucous.

α) Leaves small, 2—4 cm long . .

5. *P. Isachne*.

β) Leaves broader, 6—15 cm long .

6. *P. geminatum*.

2. Leaves green.

α) Panicle loose

7. *P. obtusifolium*.

β) Panicle dense

8. *P. muticum*.

IV. Spikelets loosely and irregularly panicled. Lower glume and upper glume of perfect flower nearly wanting.

- a) Leaves hairy or hispid 9. *P. miliaceum*.
- b) Leaves glabrous (or nearly so).
 - 1. Culms hard, branched 10. *P. turgidum*.
 - 2. Culms not branched.
 - α) Culms many noded, from a long creeping rhizome; stoloniferous . 11. *P. repens*.
 - β) Culms 4-to many-noded from a often decumbent branched base, not stoloniferous.
 - † Leaves lanceolate 13. *P. Petiverii*.
 - †† Leave linear 12. *P. coloratum*.
- B. Spikelets spiked, having a one-sided involucre of „bristles“ (barren inflorescence branches) persisting after the falling off of the spikelet.
 - I. Bristles of involucre 2—1, twice as long as spikelets 16. *P. verticillatum*.
 - II. Bristles of involucre 3—6, green or reddish, 3—4-times as long as spikelets 15. *P. viride*.
 - III. Bristles of involucre 6—12, yellow, about thrice as long as spikelet 14. *P. glaucum*.

45. (1.) ***Panicum sanguinale*** L. Spec. Plant. ed. I (1753), p. 57. — Boiss. Fl. Or. V, p. 433. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 159 no. 1113. — *Phalaris velutina* Forsk. Fl. aeg.-arab., p. 17. — Annual. Culms creeping or roating the base, then spreading or erect, 60 to 180 cm long. Leaves 10—16 cm long by 0.75—1.25 cm broad, flat, flaccid, pubescent or glabrous; sheaths thin, rather loose, often pilose and bearded at the nodes; ligules truncate, membranous. Spikes few or many, usually 3—6, varying in length from 2.5 cm to 9 cm, crowded at the end of the culm. strict, spreading or erect: rhachis triquetrous or flattened, margins scaberulous. Spikelets geminate, one sessile, the other pedicelled, oblong-lanceolate, acute, greenish or purplish 3—5 mm long. Outer glume very minute, ovate, acute, 2nd small, ovate, lanceolate, 3-nerved, about $\frac{1}{2}$ the length of the flowering glume: 3-rd rather longer than the flowering glume, oblong, acute, 6—7-nerved, the nerves often ciliate; the fourth or flowering glume oblong, firm and subcoriaceous, acute or acuminate. — Flow. March.

M. ma. Alexandria, not uncommon in shady places — **M. p.** Burg Meglièsib near Rosetta. — **N. d.** Qalyûb and neighbourhood. Cairo: Abasiye. — **O.** Qasr Dakhel.

Local name: 'Irq-en-Najil; — Tayyin.

One of the commonest weeds in all tropical and warm countries, becoming less frequent in central Europe.

— — var. **aegyptiacum** (Retz.) Hack. ex Durand et Schinz Consp. Flor. Afr. V (1895), p. 762. — Boiss. Fl. Or. V, p. 433 — *Panicum aegyptiacum* Retz. Observ. bot. III, p. 8. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 159 no. 1114. — Annual. Culms creeping or rooting at the base, then spreading or erect. Leaves flatt flaccid; 3-rd glume 6—7-nerved, the nerves not-ciliate.

N. d. Benha, not uncommon; Damietta in gardens and ricefields near Qasr Battek; Menzaleh in gardens; Mahsama in sandy fields. — **N. v.** Elephantine and Philae not uncommon. Nile banks near Fergum. — **O.** Oasis Dakhel; Qasr Dakhel.

Local name: Tayyin.

— — var. **ciliare** Doell Rhein. Flor. (1843) p. 121. — Boiss. Flor. Or. V, p. 434. Sickenbg. Contrib. Fl. d'Eg., p. 299 no. 1113. — *Panicum ciliare* Retz. Observ. bot. IV, p. 16. — Glumes more or less ciliate with soft hairs on the lateral nerves or margins. —

N. v. mer. Thebes, near Tingur, first cataract near Aswân.

A common weed in most warm countries. Most of the Egyptian specimens have the glumes glabrous or nearly so, which constitutes the *P. aegyptiacum*. Retz. Some, however, have them more or less ciliate with soft hairs on the lateral nerves or margins, which constitutes the *P. ciliare* Retz.

46. (2.) **Panicum Crus galli** L. Spec. Plant. ed. I (1753), p. 56. — Boiss. Fl. Or. V, p. 435. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 159 no. 1116. — A coarse decumbent annual, ascending to 30 or 60 cm; the leaves rather broad, without any ligula. Panicle dense and usually secund, of simple branches or sessile spikes, the lowest 2,5 to 5 cm long, the upper ones gradually shorter, the whole panicle in some varieties densely hispid with the long purplish or green awns. Spikelets about 3 mm long, more or less pubescent, acuminate or awned, crowded and clustered along the branches, the rachis usually bearing numerous cilia or capillary bristles amongst or below the spikelets. Outer glume very short and broad, 2nd and 3rd glumes nearly equal and 3-nerved, usually ciliate on the margins, the 2nd produced into a rather short awn, the 3rd in the common Egyptian form with an awn varying from 1 to 2 cm, and a thin palea and very rarely a male flower in its axil: Fruiting glume smooth and shining without any or only a very short point. —

M. ma. In ricefields near Alexandria; on the sides of irrigation canals near Rosetta. — **N. d.** Fua; Kafr Dowar. Menzaleh in running water; common and vigorous; — Damietta in ricefields common; Near Abu Hamâd in ricefields; Tanta on the sides of irrigation canals. — **O.** Oasis Dakhel. —

Local name: dineyb.

A common weed in most hot and some temperate countries and very probably only as an introduced weed in several of the Egyptian localities.

— — var. **echinatum** (Willd.) Boiss. Flor. Or. V, p. 435. — Aschers.-Schweinfurth Ill. Fl. d'Eg., p. 159 no. 1116. — *Panicum echinatum* Willd. En., p. 1032. — Lower glume of neutral flower with a very long awn. —

N. d. Benha el Asl, not common.

Local name: dineyb.

— — var. **Sieberiana** Aschers. et Schweinf. Suppl. Fl. d'Eg. (1889), p. 777. — *Panicum Sieberianum* Sickenberg. Contrib. Fl. d'Eg., p. 300 — perennial, robust; culms procumbent; sheaths generally exceeding the nodes, densely hispid with tubercle-based hairs.

N. d. Rosetta and neighbourhood; Damietta; Quirnis; Menzaleh; Matariya. — Collected and cultivated largely for fodder.

Local name: Omshut; omshôt, khanîn (Ascherson).

— — var. **stoloniferum** Schweinf. et Muschler var. nov. culms stiff, thickish, below, stoloniferous, glabrous, only the sheaths densely hirsute.

N. d. Zaqaziq, common on the sides of irrigation-canals.

Local name: muddeyt.

A common weed in most hot and some temperate countries and very probably only as an introduced weed in several localities of Egypt, most frequently the long-awned state of the plant, but occasionally with the awns short or reduced to short points as is frequently the case in Europe.

47. (3.) **Panicum colonum** L. Syst. veg. ed. X. (1759), p. 870. — Boiss. Flor. Or. V, p. 435. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 159 no. 111f. — Sickenberg. Contrib. Fl. d'Eg., p. 300. — Stems erect or decumbent at the base, 60 cm high or more. Leaves flat, glabrous. Panicle of several (about 8 or 10) simple one-sided distant and usually erect branches or sessile spikes, 1.27—2 cm long, and not diminishing much upwards. Spikelets about 3 mm long, ovoid, sessile and densely crowded in about 4 rows, the rhachis without bristles but occasionally a few small empty scales (abortive spikelets?) at the base of the spike. Outer glumes coarsely pubescent or nearly glabrous, the lowest nearly half as long as the 2nd and 3rd, which are nearly equal, often ending in short points but not awned; a palea in the 3rd glume. Fruiting glume smooth and shining. —

M. ma. In gardens at Ramle near Alexandria; in cultivated land near Alexandria. — **N. d.** Damietta in rice-field near Menzaleh; on the sides of irrigations canals near Mansura; in cultivated land at Tanta; in fields and gardens at Cairo; in cotton fields near Helwan. — **N. f.** Medinet-el-Fayûm. — **N. v.** Siut. Erment, Esne in fields near Aswân. — **O.** Great Oasis, Ain el Gellagais; Kharge; Farâfra; Dakhel. —

Local name: beshâft; diffre. Showâsh; aburukba. —

— — **arabicum** (Nees) Sickenberg. Contrib. Fl. d'Eg., p. 300. — *Panicum arabicum* Nees in Steud. Gram., p. 63. — *Panicum colonum* var. *leiantha* Boiss. Fl. Or. V., p. 436. — Aschers.-Schweinf. Illustr. Fl. d'Eg., p. 150 no. 1117. — Spikelets glabrous, spikes very loose. —

M. ma. Near Alexandria. — **N. d.** Kafr Dowar; in fields at Shubra near Cairo. — **N. v.** Siut. — **O.** Kharge.

Local name: beshâft.

— — var. **glaucum** Sickenberger Contrib. Fl. d'Eg. (1901), p. 300. — Culms robust; leaves glaucescent.

M. p. Rosetta. — **N. d.** Shubra in cotton-fields.

— — var. **repens**¹⁾ Sickenberger in Contrib. Fl. d'Eg. (1901), p. 300. — Culms branching from the base, rootening at geniculate lower joints.

M. p. Damietta, on the sides of irrigations canals. — **N. v.** Shubra in fields. —

Common in the tropical and subtropical regions of the Old World and in many parts of America. The figure of Jacq. f. Ecl. Gram. tab. XXXII does not appear to me to represent the true *Panicum colonum*.

48. (4.) **Panicum prostratum** Lam. Encyclop. méth. Bot. IV (1810) p. 745. — Boiss. Fl. Or. V, p. 438. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 160 no. 1121. — *Panicum Sieberi* Willd. Enum. Pl. hort.

¹⁾ Sickenberger has published in his Contributions à la Flore d'Egypte, p. 300 a new species *Panicum Oryztorum* Sickenbg. (Anuum. Laete viridis, culmo striete erecto, compresso, glabro, foliis scabridis. Glumelli Flosculi inferioris in aristam longam, flexuosum productis a Panic. crusgalli sicut et Panic. colonum culmo insigniter laete viridi et striete erecto nec glaucescenti divaricato-statim discernitur.

M. Rizières Charabas! Rosette! N. Fayoum!

As I have seen no material of this new species and as the diagnosis is incomplete, I have not included it in the Manual Flora of Egypt. Possibly the plant in question may be a variety either of *Panicum crus galli* or *Panicum colonum*.

Berol. I, p. 207. — Annual. Stems slender, tufted, much branched, procumbent 15 to 30 cm long; nodes numerous, glabrous, or pilose. Sheaths 2 to 3 cm long, pilose at the throat; leaves spreading, lanceolate, acute, cordate at the base, 2.5 to 5 cm long, glabrous or finely pilous. Panicle rhomboid, 2.5 to 4 cm long, with 6—12 erecto-patent branches, the lower ones 2 to 3 cm long; rhachis of spikes flattened, naked or beset with a few long white bristly hairs: spikelets secund, irregularly imbricated, oblong, acute 0.5 mm long. — Flow. March to April.

N. d. Cotton and rice fields; Shubra near Cairo in cotton fields: Cairo, Gardens of Wak and along the Kkalik. —

Also known from the tropical regions of both hemispheres.

49. (5.) **Panicum Isachne** Roth ex Roem. et Schult. II, p. 458. — *Panicum cruciforme* Sibth. and Sm. Fl. Graec. I, p. 59. — Boiss. Fl. Or. V, p. 437. — Aschers.-Schweinf. Ill. Fl. d'Eg. p. 159 no. 1120. — Sickenberg. Contrib. Fl. d'Eg., p. 301. — Annual; culms geniculately ascending from a sometimes decumbent and rooting base, very slender, 30 to 60 cm long, terete or angular, glabrous, 3-to many-noded, much branched below, simple above; sheaths rather tight, terete or subterete, strongly striate, softly hairy or glabrous except at the minutely villous nodes, the upper shorter than the internodes; ligule a dense fringe of stiff hairs; blades linear-lanceolate from a rounded base, acute, 2.5 to 3 cm by 2.5 to 5 mm, flat or involute, rather rigid, softly hairy or quite glabrous, margins very scabrid: spikes 2—10, secund or subsecund, on and usually adpressed to a filiform scabrid axis 2.5 to 6 cm long, as long as or longer than the internodes, very slender, 1 to 2 cm long; rhachis filiform, wavy, triquetrous, scabrid; pedicels solitary, very short, stout, scabrid or bristly, tips thickened with hyaline margins; spikelets 2-ranked, secund, contiguous, oblong, subacute or obtuse, about 2.5 mm long, pallid with purplish tips, softly pubescent; lower glume facing the rhachis, minute, nerveless, rarely 1 mm long and 1-nerved; upper membranous, oblong 5-nerved, minutely hairy; lower flower usually barren, sometimes male: valve like the upper glume, but narrower, 5—3-nerved; pale very obtuse, subequal to the valve in male, shorter in barren flowers; bisexual flower elliptic-oblong, rounded at both ends, 0.5—1 mm long; valve subcoriaceous, faintly 5-nerved, shining, whitish, finely granulate; anthers 1.27 mm long; grain oblong-ellipsoid, 1.27 mm long; hilum orbicular, $\frac{1}{2}$ the length of the grain.

N. d. Tanta, not common; Qubba Shubra. — **N. f.** Medînet-el-Fayûm.

Local name: Thamâm.

Also in the Mediterranean countries, India and Abyssinia.

50. (6.) **Panicum geminatum** Forsk. Fl. aeg.-arab. (1775), p. 18. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 158 no. 1119. — Sickenbg. Contrib. Fl. d'Eg., p. 301. — *P. paspalodes* Pers. Syn. pl. I, p. 81. — Boiss. Fl. Or. V, p. 436. — Stem 30 to 120 cm high, erect from a stout creeping base, often as thick as a swans quill, smooth, soft, striate, lower internodes 5—10 cm long, clothed with large loose sheaths, upper 4 to 6 cm, nodes quite glabrous; leaves 8 to 16 cm long, narrowly linear, finely acuminate, softly coriaceous, glabrous; margins quite or nearly smooth, often incurved, base narrow, sheaths often longer than the internodes, glabrous, margins thin, eciliate, ligule a ridge with erect hairs; panicle 6 to 15 cm long, rhachis strict, erect, angular, glabrous or minutely scaberulous; spikes many, 1.77 to 3 cm long, unilateral, sessile, longer than the internodes of the rhachis and often appressed to it, rhachis glabrous or ciliolate; spikelets 2 to 3 mm long, secund, biseriate, imbricate, ovoid, plano-convex; lower glume about one-third the length of the 3rd, transversely oblong, veinless, white, 2nd and 3rd thinly herbaceous, 2nd as long as the fourth or nearly so, orbicular-ovate, 7-veined, tip subacute or rounded, 3rd ovate, subacute, 5-veined, paleate, empty or male palea broad, the fourth sessile, broadly ovoid, mucronate, thinly coriaceous, dorsally compressed, smooth or nearly so, palea with inflexed membranous margins; grain orbicular, compressed. — Flor. November.

N. d. Rosetta; Damietta in ricefields not uncommon; in gardens; Mex near Alexandria, in sandy ground, Damanhur abundant; Ramle, on the sides of irrigations-canals; Menzaleh in rice-fields. Suez, Fresh water canal. — **O.** Little Oasis; Dakhel.

Local name: ssoomâr; soomâr dakr; ssafoon.

Also found in Africa, Arabia, India, Afghanistan and America.

The name *P. geminatum* Forsk., being earlier by 8 years than *P. fluitans* Retz. Obs. Bot. V (1783), p. 18 must be adopted for this plant.

51. (7.) **Panicum obtusifolium** Del. Flor. d'Egypte (1813), p. 150 tab. V, Fig. 1. — Boiss. Fl. Or. V, p. 436. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 159 no. 1118. — Sickenberg. Contrib. Fl. d'Eg., p. 301. — Battand. Trab. Fl. de l'Algér. I, p. 36. — 50 to 80 cm high; glabrous; culms stout, rooting at nodes below. Leaves linear-lanceolate, acuminate, 20 to 30 cm long, 0.2 cm broad. Panicle terminal very dense, 1 cm long, spikes 3 to 12 solitary, short peduncled, scattered, linear, 3 to 4 mm long, unilateral; spikelets loosely imbricated, pedicelled, oblong, acute, green with reddish tinge; glumes membranous, the lower one-third as long as the upper, ovate, 3-nerved, the upper similar to the lower glume of the staminate flower, ovate, acute, 5-nerved; upper glume of the

staminate flower as long but narrower; pales of fertile flower coriaceous, with, wrinkled-punctate. — Flow. November.

N. d. Damietta, on the sides of irrigation canals of the cotton fields, common; Rosetta; Zaqaẓīq; Shubra, in cotton-fields. —

Local name: shawāsh.

Also known from Algeria.

52. (8.) **Panicum muticum** Forsk. Fl. aeg.-arab. (1775), p. 20. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 160 no. 1122. — *P. numidianum* Lam. Illustr. gen. Encycl. I (1791), p. 172. — Boiss. Fl. Or. V, p. 438. — Battand. Trab. Fl. de l'Algér. I, p. 36. — *P. leiogonum* Sieb. Pl. Aegypt. ex Knuth non Del. — 6 cm or more; glabrous; culms stout, rooting at nodes below. Leaves linear-lanceolate, acuminate, 2 to 3 cm long, 0.12 broad. Panicle terminal, loose, 1 long, spikes 5—12, solitary, short-peduncled, scattered linear, 3 to 4 mm long, unilateral; spikelets loosely imbricated, pedicelled, oblong, acute, green with reddish tinge; glumes membranous, the lower one-third as long as upper, ovate, 3-nerved, the upper similar to the lower glume of the staminate flower, ovate, acute, 5-nerved; upper glume of staminate flower as long but narrower; glumes of fertile flower coriaceous, white, wrinkled-punctate. —

N. d. Alexandria, weed in fields; Damietta in ricefields; Rosetta; Damanhur; Tell-el-Barud.

Local name: rookêbeh (Schweinf.) rookeiebe; Ussebe [rikebeh Delile].

Also known from Algeria.

53. (9.) **Panicum miliaceum** L. Spec. Plant. ed. I (1753), p. 58. — Boiss. Flor. Or. V, p. 441. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 160 no. 1127. — Batt. et Trab. Fl. de l'Algér. I, p. 36. — Annual. With erect or decumbent culms, rather stout, 25 cm high, glabrous or hirsute. Leaves 10—20 cm long, 0.75—2 cm wide, more or less pubescent; panicle rather dense, 8—20 cm long; branches erect or ascending; spikelets 4—5 mm long, acuminate; first glume about two-thirds as long as the spikelet, acuminate, five to seven-nerved; 2nd 4—5 mm long, acuminate, thirteen-nerved somewhat exceeding, the seven to thirteen nerved, acuminate 3rd-one, which subtends on empty glume; 4th shorter than the third, becoming indurated, obtuse. — Flow. July.

N. d. Tanta, on the sides of irrigations canals, not common, spontaneous.

Local name: dokhn.

This grass is chiefly cultivated in Lower-Egypt. — Cultivated since pre-historic times. It is not known in a wild state. Perhaps indigenous to the East-Indies; extensively cultivated in China and Japan and the East-Indies and occasionally in southern Russia.

54. (10.) **Panicum turgidum** Forsk. Fl. aeg.-arab. (1775), p. 18. — Del. Fl. Aeg. Illustr., p. 19 tab. IX, Fig. 2. — Boiss. Fl. Or. V, p. 441. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 160 no. 1126. — 60 cm to 1,5 m high; glabrous, glaucescent; culms hard, reed-like, thickened at nodes, proliferous, branches clustered, forming tangled bushes. Leaves of forks reduced to lanceolate, leafless sheath, imbricated at nodes, persistent, that of the uppermost ending often in a short, subulate lamina. Panicle terminal, 1 cm to 1,5 cm long, branches stiff; spikelets short-pedicelled, erect, ovate, inflated, white; glumes concave, nearly of equal length, acutish, with 7—9, green nerves; pales of staminate flowers alike; fertile flower elliptical, acute, coriaceous, white, glossy. — Flow. April. —

D. i. Pyramids of Giza. — **D. i.** between Ismailia and Suez common on the sandhills of the desert and most characteristic of that country, growing in small bright tufts, and most luxuriantly in localities where one would say nothing could possibly exist. — **D. a. sept.** Margin of the desert at Esne; Gebel ahmar; Wady Rished, Wady Hof near Helwan. — **D. a. mer.** on sandy hills near Wady Halfa; Ras Mreya, Ras Humra, Wady Gadire. — Wady Tundebah between Qoseyr and Ras-Benass. — **O.** Great Oasis. —

Local name: quseb; retem; athaman; ssaffâr; shoosh; bekâr; aburukbe. —

Also found in Abyssina, Nubia, Socotra, Sinai, Palestine and Syria.

Common on the sandhills of the deserts. In the pure sand it throws out long spongy rootlets 3 mm thick, by means of which it seems to maintain a supply of moisture for itself.

55. (11.) **Panicum repens** L. Spec. Pl. ed. II (1762), p. 87. — Boiss. Fl. Or. V, p. 440. — Aschers.-Schweinf. Illustr. Fl. d'Eg., p. 160 no. 1124. — Suppl., p. 778. — Sickenberger Contrib. Fl. d'Eg., p. 301. — Perennial; rhizome bulblike swollen; innovation shoots extravaginal, often growing into long stolons, or intravaginal; culms erect or ascending, 15 cm long, glabrous, densely and distichous leafy below, many-noded, simple or branched at the base; sheaths generally exceeding the nodes, rather tight, firm, finely striate, glabrous, rarely finely hirsute with tubercle-based hairs; ligule a membranous ciliate rim; leaves linear, shortly tapering to a callous point, 4 to 10 cm long by 2 to 4 mm broad; usually involute, rarely flat, rigid, spreading, glaucous, glabrous or hairy, particularly on the upper surface, margins

cartilaginous, smooth or adpressedly spinulous and sparingly tubercled near the base; panicle strict, contracted, 6 to 10 cm long; branches usually erect, solitary or 2—3-nate, the lower remote and 7 to 8 cm long, sparingly divided, filiform, often wavy, angular, scaberulous; pedicels usually solitary, the lateral about 1 mm long, the terminal much longer, scabrid, tips subcupular; spikelets erect, ovate-oblong, acute, 2.5 to 3 mm long, glabrous, pallid; lower glume subhyaline, whitish, very broad, rounded or sometimes shortly subacute, 5—3-nerved to nerveless, upper glume thin, membranous, except the firmer tip 2 to 3 long, 9—7-nerved; lower flower male; flowering glume like the upper glume; pale subequal to the flowering glume, oblong, obtuse; anthers 0.75 to 1.5 mm long; hermaphrodit flower elliptic subacuminate or subobtuse, 2.5 mm long, white, smooth, shining; glume coriaceous, finely 7-nerved, grain white, 1 mm long. —

N. d. Mansura in fields; Teh-el-Barud in fields; Menzaleh, on the sides of irrigation-canals in rice fields; Rosetta, in rice fields; Damietta. — **O.** Little Oasis, Ain Murun. —

Local name: sūmmâr enteia (Schweinf.); sommâr (Muschler) Qsseyba; nisseile or nesseyle (Schweinf.).

— — var. **leiogonum** (Del.) Schweinf. Bull. Inst. Eg. (1887), p. 329. — Suppl. Ill. Fl. d'Eg., p. 778. — *P. leiogonum* Del. Fl. Aeg. Illustr. (1813), p. 51. — Aschers.-Schweinf. Illustr. Fl. d'Eg., p. 160 no. 1125. — Leaves slender and narrow; spikelets arranged very loosely, long pedicelled. — Flow. March. —

N. d. Damietta; Khanka; Cairo in old arabic gardens. Shubra near Cairo, in fields and in gardens.

Local name: sommâr.

Throughout the Mediterranean Region and India to South China and the Malayan Archipelago. — This grass is common, frequently as a weed. It is very variable. The forms occurring in cultivated fields are stout and hispid (var. *agresta* Sickenberger l. c., p. 301); the forms occurring in running water are slender (var. *fluviale* Sickenberger l. c., p. 301).

56. (12.) **Panicum coloratum** L. Mant. Pl. I (1767), p. 30. — Boiss. Flor. Or. V, p. 440; Aschers.-Schweinf. Ill. Fl. d'Eg., Suppl., p. 778 no. 1125. — Sickenberger Contrib. Fl. d'Eg., p. 301. — Annual; culms erect or ascending from a geniculate, often decumbent and branched base, rather stout, 60 cm or more long, glabrous, 4—8 noded, internodes more or less exserted; sheaths striate, glabrous, or more or less hirsute with tubercle-based hairs, the upper rather tight; ligule a membranous minutely or obscurely ciliate rim; leaves linear to lanceolate-linear from a usually widened and rounded base, tapering to an acute point, 10 to 16 cm long by 5 to 7 mm

broad, flat, suberect, slightly rigid or sometimes flaccid, glabrous or sparsely hairy, glaucous or subglaucous, margins smooth or scaberulous, more or less tubercled towards the base; panicle erect or nodding, loose, 8 to 10 cm long, up to 12 cm broad when fully expanded; axis very slender, smooth, at least below; branches solitary, opposite or 2—4-nate, distant, the lowest 8 to 10 cm long, filiform to capillary, straight or flexuous, loosely divided from 1 to 3 cm above the base, scaberulous or smooth below; pedicells solitary or 2-nate, unequal, the longer 1 to 2 mm long, with cupular tips; spikelets scattered or in scattered clusters or more or less approximate, oblong, acute 1 to 2 mm long, glabrous, green or purple, lower glume very broadly ovate, acute, up to 1 mm long, 3- to 5-nerved; upper glume oblong, subacute, prominently 7-nerved; lower flower male; flowering glume like the upper glume, sometimes very slightly longer, 9-nerved; bisexual flower narrow, oblong, subacute, almost 2.5 mm long, yellowish, shining, smooth; glume 7-nerved; anthers 1.27 to 2 mm long. — Flow. April. —

M. ma. Ramle, in fields, not common; Damietta in gardens as weed. — **N. f.** Medinet el Fayûm. — **N. d.** Benha; near Farshut. — **N. v.** at Dabbaieh near Aswân in sugar cane-fields. —

Local name: Qseyba.

Also in Nyassaland, Cape Colony and on the lower Zambesi.

The spikelets are very similar to those of *P. repens*, but on the whole smaller. This, together with the mode of growth and the more graceful and ampler ramification of the panicle, makes the distinction of *P. coloratum* from broad leaved forms of *P. repens* easy. *P. coloratum* of Jacquin (Ic. I, p. 12) which is often quoted as synonymous with *P. coloratum* L., is identical with *P. virgatum* L., an American plant.

57. (13.) **Panicum Petiverii** Trin. Gram. Icon. et descript. II (1829) tab. 176. — Boiss. Flor. Or. V. p. 439. — Aschers.-Schweinf. III. Fl. d'Eg., p. 160 no. 1123. — Sickenberg. Contrib. Fl. d'Eg., p. 301. — Pan. Sorghi Del. Fl. Aeg. Illustr., p. 57 no. 80. — Annual, densely tufted, nearly glabrous. Stems 30 cm or more long, ascending, with 6-8 glabrous nodes. Upper sheaths 2.5 to 4 cm long; leaves lanceolate, acuminate, 4 to 6 cm long, 0.6 to 0.75 cm broad. Panicle rhomboid, 4 to 6 cm long, with several erecto-patent branches on each side, the lower 2 to 3 cm long; spikelets sessile or shortly pedicelled, equilateral, oblong, acute, 21 mm long, finely hairy. — Flow March.

N. v. In Sorghum-fields of Upper-Egypt (Delile).

A species spread through the tropics of the Old World.

58. (14.) **Panicum glaucum** L. Spec. Plant. ed. I (1753), p. 56. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 160 no. 1128. — *Setaria glauca* P. Beauv. Ess. Agrost. (1812), p. 51. — Boiss. Flor. Or. V, p. 442. — Batt. et Trab. Fl. de l'Alg. I, p. 37. — An erect annual, 30 to 60 cm high, with flat leaves and a bristly, cylindrical, spike-like, densely flowered panicle, 2—6 cm long. Culms scabrous just below the panicle, otherwise smooth. Sheaths smooth: ligule a dense fringe of smooth hairs; leaf-blade 6—20 cm long, 4—10 mm broad, nearly smooth on the dorsal surface, very scabrous on the upper surface and margins, and occasionally pilose near the base. Axis of the panicle densely pubescent. Bristles five to ten on each spikelet, yellowish or rarely purplish. Spikelets ovoid, about 3 mm long. First glume about 1 mm long, three-nerved, second nearly half the length of the spikelets, five-nerved; the third five-nerved and as long as the transversely rugose, flowering glume. — Flow. March to June.

M. ma. Alexandria, on the sides of the canal on shady places. — **N. d.** Damietta; environs of Cairo in fields and gardens as a pernicious weed. — **N. v.** Siut, not rare. — **O.** Great Oasis. Gyaw; Kharge; Dakhel; Farâfrah, on shady places.

Local name: safiah; sar-el-fâr (Forsk.).

Most warm and many temperate countries.

59. (15.) **Panicum viride** L. Syst. veg. ed. X (1759), p. 870. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 160 no. 1129. — *Setaria viridis* P. Beauv. Ess. Agrost., p. 57 tab. 14, Fig. 3. — Boiss. Flor. Or. V, p. 443. — Batt. et Trab. Fl. de l'Alg., p. 37. — An erect, glabrous, caespitose annual, 20 to 90 cm high, with short, lanceolate leaves and dense, cylindrical, spike-like, green panicles, 2 to 10 cm long. Culms usually much branched at the base, glabrous; nodes smooth; leaves 5 to 25 cm long, 4—10 mm broad, long acuminate, slightly scabrous on both sides; bristles slender, strict, spreading, antrorsely scabrous, 1 to 1.5 cm long, green or rarely purplish. Spikelets about 2 mm long; second and third glume five-nerved, equalling the spikelet; flowering glume elliptical, rounded at the apex, finely and faintly transversely wrinkled below, or only striate and pitted. — Flow. March.

N. d. Rosetta in fields; Cairo in the gardens as weed.

With the same geographical range as *P. glaucum*, this is, however, much less common in tropical countries, but more so in central Europe, extending eastward all across Asia.

60. (16.) **Panicum verticillatum** L. Spec. Plant. ed. 2 (1762), p. 82. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 160 no. 1130. — *Setaria*

verticillata P. Beauv. Ess. Agrost. p. 51. — Boiss. Flor. Or. V. p. 443. — Batt. et Trab. Fl. de l'Alg. I. p. 37. — Panicum aparine Syn. pl. gram. (1855), p. 52. — P. verticillatum subsp. Aparine Aschers. et Schweinf. Ill. Fl. d'Eg., p. 161 no. 1130. — Setaria verticillata subsp. aparine Durand et Schinz Consp. Flor. Afric. V. p. 775. — A low, spreading, much branched annual, 10 to 30 cm high, with short cylindrical spike and lanceolate leaves, 3-6 cm long. Culms compressed, geniculate, decumbent, very glabrous; nodes smooth; sheaths very loose, striate, compressed, glabrous, margins smooth, shorter than the internodes; ligule short, densely ciliate-fringed with white hairs; leaves 3-6 cm long, 4-8 mm broad, cordate at the base, long-acuminate at the apex, scabrous, and sparingly papillate-ciliate on both sides, especially below, margins cartilaginous, serrulate-scabrous. Inflorescence dense, cylindrical, 1-3 cm in diameter, purplish; common axis angular, scabrous, branches very short, subverticillate, densely flowered, bristles 1-2, purple, stout, flexuous, retrorsely scabrous, 3-8 mm long. Spikelets 1-2 mm long, nearly sessile, elliptical-ovate; first glume triangular ovate, acute or obtuse, 3-nerved, about one-third the length of the spikelet; second glume ovate, obtuse, 5-7-nerved, nearly equaling the 5-7-nerved, acute third glume, which bears a short palea in its axil; flowering glume about 1.5 mm long, elliptical, ovate, acute, striate nearly smooth or very finely transversely wrinkled below. Palea similar in texture and markings, about as long as the glume. — Flow. April.

M. ma. Matruqa, Alexandria in fields; Benha; Damietta; Rosetta in gardens. — **N. d.** Cairo in fields and in gardens. — **N. v.** Beni-Suef in gardens; Aswân. — **O.** Farâfrah; Dakhel.

Local name: no'emêh; gamh-el-fâr.

— var. **ambigua** Guss Prodr. Flor. Sic. (1827), p. 80. — Setaria ambigua Guss. Flor. sic. syn., p. 114; Setaria viridis var. ambigua Coss. et Durieu Expl. scient. Algér. II, p. 36. — Spike more compound, interrupted at the base. — Flow. March to April. —

M. p. El Arish (Ascherson).

Local name: shubbêt.

Throughout Africa and India to Malaya, elsewhere (Europe, Australia America) only as a weed. A. Braun (Ind. Sem. Hort. Berl. [1871] App. 5) distinguishes several subspecies and a considerable number of varieties of this grass. I cannot follow him. There is, however, this remarkable fact that the plant is very uniform where it occurs exclusively as a weed, but very variable in the remainder of its area. The species was originally described by Linnaeus from the European plant which thus represents the type. Nearly all the other forms come under A. Braun's subspecies Aparine.

26. (9.) **Cenchrus** Linn.

Spikelets narrow, with a single bisexual flower with or without a male flower below it, enclosed 1—4 together in an ovoid or globose involucre of numerous bristles or spines, the inner of which are broad and flattened, connate at the base and hardened in fruit; the involucres sessile in a terminal spike or raceme, and deciduous with the spikelets. Glumes 4; the outer much the smallest, sometimes minute, empty; the second equalling to the third or a little shorter, empty; the third usually containing a palea and sometimes 3 stamens; the fourth or flowering glume rather shorter than the third and more rigid. Stamens 3. Styles often connate at the base. Grain enclosed in the flowering glume and palea, free from them. — Annual or perennial grasses, usually tall. Leaves flat, flaccid.

Species about 12, in the warm regions of both hemispheres and in temperate North America.

61. **Cenchrus montanus** Nees ex Royle Illustr. Bot. Himal. (1839), p. 406. — Boiss. Flor. Or. V, p. 448. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 162 no. 1135. — Annual. Culms tufted, tall, procumbent or ascending, 20 to 40 cm high. Leaves long, linear or linear-lanceolate, acuminate, 0.5 to 1.5 cm broad, flat, glabrous or pubescent; sheaths long, rather loose; ligule split into numerous thin erect bristles. Spike 5 to 6 cm long by 2 cm broad, stout, dense; rhachis angular, pubescent. Involucres about 0.63 cm long, sessile or very shortly pedicelled, spreading or at length deflexed, broadly ovoid; inner bristles 8—12, connate at the base, compressed, unequal in length, sometimes one much longer than the rest, lower $\frac{2}{3}$ plumose with soft spreading hairs, much shorter, spreading, subulate, scabrous throughout. Spikelets 1 or 2 within the involucres; outer empty glume half the length of the 2nd, ovate, acute, 1-nerved; 2nd rather shorter and broader than the 3rd, 3-nerved; 3rd with a palea and male flower, 5-nerved; 4th or flowering glume rather shorter and narrower, firmer in texture. — Flow. March.

O. Temple of Hibe in the Great Oasis; **D. a. mer.** Wady Lekhuma on stony ground between Qoseyr and Ras Benass.

Also known from Nubia, Abyssinia, tropical Arabia and northern India.

27. (10.) **Pennisetum** Pers.

Spikelets oblong or lanceolate, solitary or in clusters of 2—4, subtended by and deciduous with a sessile or peduncled involucres of naked or plumose bristles, and arranged round the axis of spike-

like usually cylindric panicles; lower flower male or barren with or without a pale; upper flower bisexual. Glumes usually small and hyaline, lower sometimes obsolete, upper rarely one half of the length of the spikelet or more and then several-to 7-nerved. Flowering glume equal or subequal, membranous to chartaceous, 5—7-nerved, or the lower more or less reduced, thinner, fewer-nerved. Pales subequal to the flowering glume and of similar texture. 2-nerved or more or less reduced in the lower flower. Lodicules small, usually in front and outside the pale, or 0. Stamens 3. Styles distinct, slender or connate. Grain enclosed by the slightly changed glume and pale (see also in *P. typhoideum*), broadly oblong, slightly dorsally compressed to subglobose; hilum basal, punctiform; embryo large, $\frac{2}{2} - \frac{3}{4}$ the length of the grain. — Perennial or annual; culms simple or often profusely branched; leaves flat or convolute; ligules usually reduced to a ciliate rim or a fringe of hairs, rarely membranous: panicle spike-like, usually dense, branches very numerous all around the axis, very short, simple, with a solitary spikelet, or scantily divided with the spikelets in clusters of 2—5; the solitary spikelets or the clusters subtended by and deciduous with an involucre (very rarely a solitary bristle) of often very numerous and usually unequal scabrid or plumose simple rarely branched bristles.

Species about 40, in most warm countries, particularly in dry regions

- A. Involucre often peduncled; all or at least the innermost bristles plumose; fruiting flower readily deciduous, its flowering glume chartaceous, very smooth and shining below; anther tips penicillate; styles connate. 1. *P. americanum*.
- B. Involucre sessile; all or some of the bristles plumose; fruiting flower not readily deciduous, its flowering glume scarcely hardened, membranous; anther tips naked; styles free or more or less connate.
 - I. Culms rushlike, the lower part proliferous at nodes, much branched 2. *P. dichotomum*.
 - II. Culms not proliferous
 - a) Culms herbaceous, decumbent-geniculate or ascending; rhachis rough 3. *P. ciliare*.
 - b) Culms indurated below, erect or ascending, branching from the base; rhachis hairy 4. *P. orientale*.

1. **Pennisetum americanum** (L.). K. Schum. in Engl. Pflanzenw. Ostafri. B. (1895), p. 51. — Leeke in Unters. üb. Abstammg. der Negerhirse, p. 52. — *Panicum americanum* L. Spec. Plant. I, p. 56. — *Pennisetum typhoideum* Rich. in Pers. Syn. I., p. 72. — Boiss.

Flor. Or. V., p. 447. — *P. spicatum* Roem. et Schult. Syst. II, p. 499. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 162 no. 1134. — *Holcus racemosus* Forsk. Flor. aeg.-arab. (1775), p. 175. — Annual; culms erect, stout 30 to 90 cm high, usually terete and simple, 5-or more-noded, hairy to villous below the panicle, otherwise usually glabrous; sheaths terete, glabrous except the bearded nodes and the often villous junction with the leave, rarely hirsute, usually slightly rough, rather shorter than the internodes; ligule a narrow long and densely ciliate rim; leaves linear to linear-lanceolate from a rounded base, acute 15 to 60 cm long by 6 mm to 3 cm broad, flat, more or less rough, glabrous, rarely hirsute; panicle spike-like, cylindric, very dense, 8 to 10 cm long by 10 to 16 mm broad (in the Egyptian specimens) or longer and thicker, often purplish; rhachis stout, villous; branchlets reduced to a peduncled involucre cluster of 3—1 spikelets; peduncles villous, straight, 2.5 to 5 cm long, often horizontally spreading or partly deflexed; involucre of very numerous ciliate often purplish bristles about as long as the spikelets; spikelets sessile or shortly pedicelled within the involucre, readily deciduous when ripe, oblong, 5 to 6 mm long; pale or purplish upwards; glumes broadly ovate, obtuse, minute, hyaline, nerveless, ciliate, or larger (the upper to $\frac{1}{2}$ the length of the spikelet), firmer and 3-nerved; flowers similar, subequal, lower flower male or reduced to a minute empty hyaline glume; flowering glumes broadly oblong, cuspidate or mucronate, 5—7-nerved, glabrous, ciliate or pubescent towards the margins or the tips; pales broad, oblong, truncate, glabrous, ciliate, or the flaps pubescent below; lodicules 0; anthers 2.5—3 mm long, tips bearded; styles connate; grain ellipsoid to subglobose, equalling the gaping chartaceous very smooth glume and pale. — Flor March.

N. v. Zifta, common and subsponaneous; Aswân; Shellal. — **O.** Oasis Dakhel, Qalamûn. — (Without precise locality in Upper Egypt collected by Figari-Bey.) Cultivated in the Oasis and in the uppermost Nile Valley.

Local name: quasab; dok; hema.

Cultivated in numerous forms in tropical and northern Africa and in India.

Numerous forms of this cereal have been described by Al. Braun in Ind. Sem. Hort. Berol. 1855 Append. 24; but it is hopeless to attempt to reduce the Egyptian specimens to Braun's species, in the absence of the types. I had access to them like K. Schumann, who has given up A. Braun's classification and attempted to break up the species into two subspecies: *Wildenowii* and *Plukenetii*, according to the length of the peduncles and the general shape of the spikelets, and to divide the subspecies *Wildenowii* into several varieties. I cannot, however, agree with him, and confine myself

in this place to the statement, that all the Egyptian specimens represent more or less the typical form, drawn in Delile's figure (Fl. Egypt., p. 17 tab. VIII fig. 3). Those where the lower flower appears reduced to a small and empty glume (var. *depauperatum* [A. Br. et Bouché, sens. lat.] Aschers. et Schweinf. [-*Pennisetum mollissimum* Hochst.] and forma 7 *Aschersonii* Leeke l. c., p. 57 are evidently starved states.

63. (2.) ***Pennisetum dichotomum*** (Forsk.) Del. Fl. Egypt (1813), p. 159 Tab. VIII, Fig. 1. — Boiss. Fl. Or. V, p. 444. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 161 no. 1131. — *Panicum dichotomum* Forsk. Fl. aeg.-arab., p. 19. — Perennial, 30 to 60 cm high; culms rushlike, the lower part proliferous at nodes, much branched, forming a bush with aspect of *Panicum turgidum*. Sheaths of culms leafless, open, scarious, lanceolate, persistent; leaves of branches from a somewhat dilated sheath, rigid, convolute, the uppermost often forming an involucre to the spike. Spike cylindrical, 7 to 10 mm long, 1.5 to 2 mm in diameter, rachis scabrous; bristles of involucre of spikelets numerous, unequal, white, one and a half as long as spikelet; spikelets solitary, rarely twin, lanceolate; lower glume oblong-lanceolate, acute, 3-nerved, two-thirds as long as the upper; third glume of staminate flower as long as perfect flower concave, 5—7-nerved, oblong-lanceolate, acute; pale of staminate flower somewhat narrower and shorter; flowering glume of perfect flower mucronate-aristate. — Flow. April.

D. a. sept. Gebel aḥmar; Wady Dugla near Cairo; Wady Hof, Wady Rished, Wady Abu Shusha near Helwan.

Local name: hadah (Schweinf.) murrât ghazâl, tummâm; retem.

Also found in Arabia, Persia, Afghanistan, Somaliland, Sinai and Syria.

In the desert, in stony ground and amongst rocks, not in sand, every where in the Wadies. Collected largely for fodder, and one of the most valuable of the desert plants. It grows here very differently from what it does as usually met with in Arabia. Its stems are often 90 to 150 cm high, and resemble miniature bamboos; our horses and donkeys, however, relished it

64. (3.) ***Pennisetum ciliare*** (L.) Link Hort. reg. bot. Berol. descr. I (1827), p. 213. — Boiss. Fl. Or. V, p. 445. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 161 no. 1132. — Sickenberg. Contrib. Fl. d'Eg., p. 301. — *Cenchrus ciliaris* L. Mant. II, p. 302. — *Pennisetum cenchroides* Rich. in Pers. Syn. I, p. 72. — Perennial; culms ascending from a branched, geniculate and often decumbent, many-noded base, 35 to 60 cm high, smooth, glabrous, or scantily hairy, upper internodes more or less exserted, the uppermost much so, and very slender; leaves quite glabrous or sometimes with scattered thin stiff hairs; sheaths tight, the lower persistent, or at length

decaying, leaving the internodes naked; ligule a very narrow densely ciliate rim; blades linear, long tapering to a setaceous point, 6 to 16 cm long by 2,5 to 6 mm broad, usually flat, often flaccid, usually scaberulous above or along the margins; panicle spike-like, cylindric, dense, 2,5 to 10 cm long, 8 to 12 mm broad, pallid or purplish, often flexuous; rhachis thinly scaberulous like the very short pedicels; involucre of very numerous bristles, outer bristles thinly scabrid, shorter or slightly longer than the spikelets, inner thickened towards the base, ciliate, much longer, one usually conspicuously exceeding all the rest; spikelets 3—1 within each involucre, lanceolate-oblong, 5 to 7 mm long, pallid, glabrous; glumes hyaline, ovate, acute or acuminate, usually 1-nerved, upper about 2,5 mm long, lower shorter sometimes nerveless; flowers equal or subequal, lower male or barren very rarely bisexual; flowering glumes ovate-oblong, abruptly mucronate-acuminate, 5-nerved; pales subequal, truncate; lodicules 0; anthers slightly over 2,5 mm long, tips acute, naked; styles free nearly from the base. — Flow. April to May.

N. d. Abu Zabel. — **N. v.** Near Aswân. — **N. f.** Fayûm everywhere, Gebel el Ekhfen. — **O.** Great Oasis. — **D. i.** rare, El-Arish. — **D. a. sept.** not rare. — **D. a. mer.** Qoseyr; Sherm Luliya; Wady Gadire. —

Local name: hadah.

Throughout Africa, in Sicily and eastwards as far as North-west India.

(65.) **4. Pennisetum orientale** Rich. in Pers. Syn. I. (1805), p. 72. — Leeké l. c., p. 25. — Boiss. Fl. Or. V, p. 445. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 162 no. 1133. — *Panicum orientale* Willd. Enum. Pl. hort. Berol., p. 1031. — 30 to 60 cm high; culms erect or ascending, branching from the base. Leaves rigid, ascending, narrowly linear acuminate, somewhat convolute, sparingly hairy, minutely scabrous to glabrous; mouth of sheath ciliate. Spikes loose or dense, 8 mm to 1 cm long, 1,5 mm to 2 mm broad; rhachis hairy; pedicels short, hispid; involucre of many unequal, flexuous, reddish-violet bristles, once and a half to twice as long as spikelets, the inner scarcely thicker, plumose; lower glume ovate, 1-nerved, one-third as long as perfect flower; upper glume ovate-lanceolate, acuminate, 3-nerved, scarcely shorter than perfect flower; flowering glume of staminate and fertile flower nearly alike, ovate-oblong, 5-nerved, acuminate, short aristate; pale of staminate flower bidentate. — Flow. March.

D. a. sept. Wady To'eyrik; Wady Hamâtah.

Also known from Algeria, Sinai, Syria, Cilicia and Persia.

28. (11.) **Tricholaena** Schrad.

Spikelets oblong, laterally compressed, more or less gaping, panicle, deciduous from capillary pedicels; lower flower usually male or barren, upper hermaphrodite. Glumes very dissimilar or at least unequal, lower reduced to a minute scale or obsolete, very rarely one half of the length of the spikelet, somewhat remote from the upper; upper glume membranous, emarginate, muticous or finely mucronate or aristate from the sinus, 5-nerved, usually hairy. Flowering glumes dissimilar, lower like the upper glume with a hyaline 2-nerved subequal pale, upper much smaller, thinly chartaceous, glabrous, shining, obtuse or subemarginate, obscurely 5-nerved, with an equal 2-nerved pale of similar substance. Lodicules 2, very small. Stamens 3. Style free, slender; stigma densely plumose, laterally exserted. Grain oblong-ellipsoid, closely embraced by the glume and pale; hilum basal, punctiform; embryo about one half of the length of the grain. — Perennial, rarely annual; leaves linear to setaceous; ligule a fringe of hairs; panicles open or contracted, often much divided, with capillary branchlets and pedicels, the latter with thickened tips; spikelets often completely enveloped by soft shining hairs, rarely pubescent or quite glabrous.

Species 10—12, chiefly in the dry and hot countries of the Old World.

66. Tricholaena Teneriffae (L. fil.) Parl. in Webb et Berth. Hist. nat. Canar. III (1836—50), p. 425. — *Panicum Teneriffae* R. Br. Prdr. Flor. Nov. Holl., p. 39. — Boiss. Flor. Or. V, p. 434. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 159 no. 1115. — *Saccharum Teneriffae* L. fil. Suppl. pl., p. 106. — 30 to 60 cm high; root-stock indurated; culms branching at base, ascending. Leaves glaucescent, linear, rigid, convolute in drying, hairing at mouth of the sheath. Panicle 8 cm to 10 cm long, spreading in flower, contracted in fruit, branches capillary, flexuous; spikelets oblong, long-pedicelled; lower glume obsolete, upper similar to the lower glume of staminate flower, membranous, ovate-lanceolate, beset with long hairs; upper glume of staminate flower glabrous, narrower, more obtuse; fertile flower much shorter than the glume, pales oblong, coriaceous, glossy. — Flow. April to August. —

D. i. Desert el Tih. — **D. a. sept.** Wady Hamata-Adágah; Northern Galala, Wady Khafûra; Wady Dakhel; Gebel Ataka near Suez; upper Wady Warag; Wady Rigbe; **D. a. mer.** Wady Az'khar; Wady Etih between Qosseyr and Ras-Benass. Gebel Ferrayl near Berenicke.

Also in the other parts of Northern Africa and in Abyssinia and tropical Africa.

29. (12.) *Oryza* Tourn.

Spikelets laterally compressed, very shortly pedicelled, panicle; rhachilla jointed above the rudimentary glumes. Flower 1, bisexual. Glumes of our species reduced to an obscure hyaline entire or 2-lobed rim. Flowering glume 5-nerved, subcartilaginous, of our species awnless, keel and margins rigidly ciliate. Pale narrow, 3-nerved, subcartilaginous except at the hyaline margins, grooved along the outer nerves and tightly clasped by the inflexed margins of the flowering glume, keel rigidly ciliate. Lodicules 2, fleshy, finely nerved. Stamens 6, 3 or 1. Styles distinct; stigmas feathery. Grain ovate or oblong, compressed, embraced by the glume and the pale, free; embryo short. — Our species perennial; leaves narrow; panicle usually flaccid with very slender branches.

Species 6—7, mostly in the tropics and the subtropical regions of both hemispheres.

67. *Oryza australis* (R. Br.). A. Br. ex Schweinf. Beitr. Fl. Aethiop. (1867), p. 300. — Aschers.-Schweinf. Ill. Fl. d'Ég., p. 167 no. 1148. — *Leersia hexandra* Sw. Prodr. Veg. Ind. Occ., p. 21. — Boiss. Fl. Or. V, p. 469. — *L. aegyptiaca* Fig. and De Not in Mem. Acc. Torin. ser. II, XIV, p. 317. — Perennial; rhizome creeping, stoloniferous; innovation-buds ovoid, subacute, scales smooth, striate; stems erect from a prostrate or ascending base, rooting from the lower nodes 60 to 120 cm high, simple or very sparingly branched, usually slender and weak, many-noded, smooth, firmly striate; uppermost internode longest (up to 15 cm, rarely to 30 cm); sheaths rather tight or the lower looser and ultimately spreading, terete, usually shorter than the internodes, the uppermost longest, reaching to or almost to the panicle, glabrous, slightly scabrid or smooth, except the villous nodes; ligule short, obliquely truncate or bilobed, firmly membranous; blades narrowly linear, tapering to a fine point, 6 to 12 cm long, 2.5 to 8 mm broad, glaucous, usually subrigid, very slightly scabrid; panicle 4 to 8 cm long, erect or more or less flaccid and nodding, narrow; branches suberect, simple, up to 2.5 cm long, filiform, flexuous, angular, slightly scabrid or smooth; spikelets often closely imbricate, subsecund and laterally concavo-convex, obliquely oblong, 2.5 to 5 mm long, sometimes purplish; sides of the flowering glume scabrid or smooth; stamens 6; anthers 2.5 to 3 mm long. — Flow. April.

N. d. Alexandria; Rosetta; Damietta; Menzale; Mansura.
O. Little Oasis.

Local name: Sjurrai; shulleyk.

Widely spread through the tropical and subtropical regions.

30. (13.) **Lygeum** Linn.

Spikelets 2—3; the involucre incloses two flowers lying side the whole of their length, which is nearly equal to that of the involucre; clothed at their common base with a dense covering of long silky white hairs. Glumes unequal, membranous, the outer embracing the inner, linear-lanceolate, very pointed, carinated, carina marked with a green streak, and each side near the base with a bluish-white spot; the inner double the length, narrow straight, its outer surface flat, inner somewhat two-sided from the inflexion and convergency of the two margins, and split at the tip into two sharp slender points. Stamens 3, anthers purple-coloured, from 2 to 8 mm long. Caryopsis oblong, nearly linear, terminated by a sharp point, a little compressed.

A genus of only one species found in the Mediterranean region.

68. **Lygeum spartum** L. Spec. Plant. ed. I (1753), p. 74. — Boiss. Fl. Or. V, p. 452. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 162 no. 1137. — Sickenberg. Contrib. Fl. d'Eg., p. 301. — Plant growing in tufts. Rhizome perennial, creeping. Culms simple, straight, firm, cylindrical, smooth, shining, solid, 20 to 40 cm high; generally only one node visible, from which issues the last leaf. Leaves close at the lower part of each culm, seldom fewer than four in number; sometimes shorter, sometimes longer than the culm: either straight or variously recurved, firm, cylindrical, the inner surface marked with a groove, which disappears in drying, gradually tapering into a very fine and stiff point; smooth, of a whitish-green colour; the last distinct and distant from the others. Sheaths enveloping the lower part of the culm, sheathing one another successively, terminated by the membranous linear ligula; involucre, flowers etc. vide the generic character. — Flow. April.

M. ma. Matruqa; Abukîr. — Mex; Mariut; Ma'ara near Bir Hamam. — **M. p.** Rosetta. — N. E. of Gebel Nebbi Geham, el Arish; Ras el Kanais, Dakalla.

Local name: halfa (Muschler.) benî-esh-shâm; berim-shâm; deyl-el-quitt.

A species widely dispersed throughout the Mediterranean region.

31. (14.) **Phalaris** Linn.

Spikelets laterally compressed, in contracted more or less spike-like panicles; rachilla disarticulating above the glumes, not or obscurely produced beyond the uppermost flower. Flowers 3, the lower 2 minute, rudimentary, the uppermost bisexual, enclosed

by the glumes. Glumes subequal, boatshaped, keeled, keel often winged. Empty glumes very small, subulate to lanceolate, membranous, with a callous base, or 1 or both reduced to a minute callous scale; fertile glume thin, ultimately rigid, 5-nerved, awnless, ovate, acute. Pale almost as long as the glume, 2-nerved (sometimes obscurely). Lodicules 2, hyaline. Stamens 3. Styles long, distinct; stigmas plumose, exerted from the top of the spikelet. Grain much compressed, ovate, free, enclosed by the glume and pale; hilum oblong, short; embryo equalling one fourth of the length of the grain. — Annuals or perennials; leaves flat; panicle terminal, stiff, spike-like, subcapitate or interrupted and lobed; pedicels very short.

Species 10, mainly natives of the Mediterranean region, but widely dispersed as weeds; 1 species in the boreal region and in South Africa, and another from California to Chile.

A. Perfect flowers villous

I. Neutral flowers two, ciliated 1. *P. canariensis*.

II. Neutral flowers one, villous 2. *P. minor*.

B. Perfect flowers glossy 3. *P. paradoxa*.

69. (1.) ***Phalaris canariensis*** L. Spec. Plant. ed. I (1753), p. 54. — Boiss. Flor. Or. V, p. 471. — Canary-Grass. An erect annual, 20 to 60 cm high, with flat leaves, and a dense, ovoid panicle about 2 cm long, empty glumes with a broad, sharp keel, with a distinct, green line within the white, scarious margins. Third and fourth glumes small, scale-like, smooth. Fifth, or flowering-glume hairy. — Flow. March.

N. d. Zifta in fields; Damanhur.

Also known from warm and temperate regions of Europe, North Africa, Western Asia and America.

70. (2.) ***Phalaris minor*** Retz. Obs. bot. III (1783), p. 8. — Boiss. Fl. Or. V, p. 472. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 167 no. 1149. — *P. ambigua* Fig. et Not. in Mem. Acc. Torin. ser II, XII, p. 326. — Annual; culms tufted, erect or ascending, geniculate, 30 to 90 cm high, glabrous, finely striate, 6--7-noded; internodes gradually longer from the base, up to 10 cm long; sheaths shorter than the internodes, the lower tight, the uppermost more or less inflated, striate; ligule scarious, white, obtuse, 2.5 to 6 cm long, blades linear, gradually tapering, 5 to 14 cm long and 2.5 to 7 mm broad, flaccid, glabrous, smooth or almost so, margins slightly rough; panicle spike-like from subglobose to cylindric, up to 5 cm long, compact; rachis and branches glabrous; spikelets obliquely elliptic, 5 to 6 mm long; glumes subequal, 3-nerved, acute, glabrous, white, nerves green, keel serrulate, suddenly contracted below the apex; the third glume

a minute callous scale; the fourth somewhat subulate, firmly membranous, hairy with a callous base, up to 2 mm long; flowering glume scantily silky; pale ciliate on the back, obscurely 2-nerved or almost nerveless; anthers 1.27 mm long; grain 6.25 mm long. — Flow. April.

M. ma. Mariut-Mergheb. — **N. d.** environs of Cairo in fields and gardens. — **N. f.** Medînet-el-Fajûm in gardens common; Gharaq. — **N. v.** Abu-Girge; not rare. — **O.** Great Oasis, Mex; Little Oasis; El-Hais; Farâfra; Dakhel.

Local name: sha'îr-el-far.

— — var. **gracilis** (Parl.) Aschers.-Schweinf. Ill. Fl. d'Eg. (1887). p. 167 no. 1149. — Boiss. Fl. Or. V, p. 472. — *P. gracilis* Parl. Pl. nov., p. 36. — Slender and smaller than the type; culms in the upper parts elongated; spikelets smaller. — Flow. March to April.

M. ma. near Alexandria common. — **N. d.** environs of Cairo among the typical forms. — **D. a. sept.** margins of the desert near Kafr Hakim; upper part of the Wady Azkhar. —

Local name: aîn-el-quṭṭ.

A native of the Mediterranean countries; introduced in many other parts of the world. —

71. (3.) **Phalaris paradoxa** L. Amoen. acad. V (1759). p. 264. — Boiss. Fl. Or. V, p. 472. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 167 no. 1150. — Annual; 20 to 40 cm high; panicle cylindrical, 3 to 5 cm long, 1 to 1.5 cm broad, tapering at the base; branches with 5—6 spikelets; the sterile spikelets on the lower branches generally rudimentary, wedge-shaped, obtuse, destitute of glumes and pales; fertile glumes furnished with a tooth-like wing below the beak-like awn. — Flow. March to April.

N. f. Medînet-el-Fajûm, in gardens.

Also known from all the other parts of the Mediterranean region.

— — var. **praemorsa** Coss. in Coss. et Durieu Expl. scient. Algér. II (1854), p. 24. — Boiss. Fl. Or. V, p. 472. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 167 no. 1150. — All the spikelets except the fertile, sterile, truncate, mucronulate, wedge-shaped. — Flow. March to April. —

M. p. El-Grâdy. — **N. d.** Damietta; Es Sâlibiya; Birket-el-Hadj near Cairo; Shubra near Cairo. — **N. d.** Abu-Girge; near Kafr Hakim in fields; Roda. — **N. f.** Medînet-el-Fayûm. — **O.** Great Oasis, Kharge; Dakhakhîn; Dakhel.

Local name: Kharfâr (Ehrenberg).

Also known from North Africa and Abyssinia.

32. (15.) *Aristida*.

Spikelets 1-flowered, narrow, paniced, rhachilla disarticulating above the glume, not produced. Glumes usually persistent, narrow, 1—3-nerved, muticous or mucronate, awnless. Flowering glume convolute, cylindric or oblong-cylindric, 3-nerved, awned, rather rigid, tips gradually tapering or minutely bilobed, sometimes jointed at or above the middle; callus villous, shortly bearded, usually pungent; awn nearly always 3-partite from the base or above the simple base (stipitate) very rarely simple, continuous with the glume or disarticulating from it or deciduous with a portion of the glume, foot straight or twisted; bristles plumose or the lateral or all naked. Pale usually oblong, 2-nerved or nerveless. Lodicules 2, finely nerved. Stamens 3. Ovary glabrous; styles distinct, short; stigmas plumose, laterally exserted. Grain slender, cylindric or oblong-cylindric, terete, sometimes grooved, tightly embraced by the glume; hilum linear almost as long as the grain; embryo short or long. — Annual or more often perennial, tufted, usually with more or less wiry culms; blades narrow, usually convolute; ligule usually a line of very short hairs; panicle varying from spike-like to effuse.

Numerous species in the dry and warm regions of both hemispheres.

- A. *Chaetaria*. Awns continuous with the glume, or articulated just below their branching point, but not deciduous, glabrous; glumes 1-nerved
 - 1. *A. adscensionis*.
- B. *Arthratherum*. Awns disarticulating from the glume, distinctly stipitate, glabrous; glumes 1-nerved.
 - I. Awn jointed, dividing in 3 bristles; undivided part of the awn half the length of the bristles 2. *A. Schweinfurthii*.
 - II. Awn jointed, dividing in 3 bristles; undivided part of the awn about one-fifth of the length of the bristles . . . 3. *A. funiculata*.
- C. *Stipagrostis*. Awns nearly always disarticulating from the glume or together with the upper part of the glume, all or only the middle bristle plumose; glumes 3-nerved.
 - I. Middle bristle of awn 2 to 5 mm long, feathery above, the lateral bristles (except *A. lanata*) not feathery
 - a) Flowering glume 2-lobed at the tip, the awn arising in the sinus . . . 4. *A. obtusa*.

- b) Flowering glume not bilobed, but with a callous tip, to which the calyptriform base of the awn is jointed
1. Nodes and ligules of leaves long ciliate; glumes glabrous 5. *A. ciliata*.
 2. Sheaths of leaves and internodes tomentellous or woolly; glumes glabrous 6. *A. plumosa*.
 3. Sheaths of leaves glabrous
 - α) glumes glabrous 7. *A. brachypoda*.
 - β) lower glumes glabrous, upper glumes ciliate 8. *A. lanata*.
 - γ) glumes scabrous 9. *A. caloptila*.
 4. Sheaths of leaves bearded in place of ligule; glumes hirtellous 10. *A. hirtigluma*.
- c) Awn divided near the base into unequal bristles, the middle 13 to 15 mm long, feathery except at the base and the tip, the lateral naked, half as long
1. Leaves not pungent
 - α) Leaves convolute, culms tomentose 11. *A. acutiflora*.
 - β) Leaves involute, culms scabrous; feather rounded at the tip 12. *A. Zittelii*.
 2. Leaves pungent
 - α) Panicles dense; leaves 8 to 15 cm long 13. *A. pungens*.
 - β) Panicles loose; leaves 10 to 30 cm long 14. *A. scoparia*.

72. (1.) ***Aristida adscensionis*** L. Sp. Plant. ed. I (1753), p. 82. — *A. paniculata* Forsk. Fl. aeg.-arab., p. 25. — *A. coerulescens* Desf. Fl. Atl. I. p. 109 tab. XXI fig. 2. — Boiss. Fl. Or. V. p. 491. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 167 no. 1155. — Sickenberg. Contr. Fl. d'Eg., p. 301. — *A. canariensis* Willd. Enum. pl. I. p. 99. — Annual or occasionally perennial with an oblique rhizome, glabrous; culms tufted, geniculately ascending, slender, from 8 cm to 60 cm long, usually branched from one or several of the lower nodes, smooth, upper internodes long exserted; sheaths tight, rather firm, smooth. ligule a line of short hairs; blades very narrow, linear, tapering to a very fine point, 2 to 18 cm long, up to 2.5 mm broad, convolute, rarely flat, smooth below, scabrid. above and on the margins; panicle

linear, spike-like, usually interrupted or oblong and more or less loose, rigid or flaccid; branches single or 2-nate, unequal, branched from the base or simple to the middle, erect or nodding or flexuous, filiform, scabrid, lateral pedicels short; spikelets 6 to 10 mm long, often purplish; glumes linear to linear-lanceolate, acute or subobtuse, 1-nerved, the lower 4 to 6 mm, the upper 6 to 8 mm long, sometimes mucronate; flowering glume linear, laterally compressed, as long as the upper glume or slightly longer, rarely shorter, scabrid along the keel and the outer nerve, otherwise smooth or scabrid, particularly below the straight tip; callus 1 mm long; awns 12 to 18 mm long, rarely shorter (down to 8 mm) or longer (up to 2,5 cm), diverging, continuous with the flowering glume, the lateral somewhat shorter; pale obtuse, less than 1,27 mm long; lodicules similar to the pale, 3—5-nerved, 1 to 1,5 mm long; anthers 1 mm long; grain almost as long as the glume. — Flow. April.

O. Little Oasis; Farâfra, in gardens; Qasr Dakhel, in gardens; Great Oasis, temple of Hibe. — **D. a. mer.** Wady Tundebah, Egyptian coast between Quoseyr and Ras-Benass.

— — var. **pumila** (Dene.) Coss. in Coss. et Dur. Expl. scient. Algér. II (1854—1867), p. 84. — Batt. et Trab. Fl. de l'Algér. I, p. 56. — *Aristida pumila* Dene. in Ann. sc. nat. IV (1835), p. 85. — Boiss. Flor. Or. V, p. 491. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 167 no. 1156. — Sickenberg. Contrib. Fl. d'Eg., p. 301. — Culms 5 to 20 cm high; glumes sometimes more unequal; flower more exserted. — Flow. April.

D. l. Farshut Khôr-el Ghattaghu. — **D. a. sept.** Gebel Shaluf in the northern part of the East (arabic) Egyptian desert. — **D. i.** Wady Omna Seifi; Wady Heudosse near Quoseyr on micaceous shist. —

Common in most dry and hot countries.

The var. *pumila* represents rather a form than a variety.

73. (2.) **Aristida Schweinfurthii** Boiss. Flor. Or. V (1884), p. 493. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 168 no. 1158. — Annual, in small compact tufts about 20 cm high; culms very slender and short, glabrous, sheathed all along; ligule a line of short hairs; leaves setaceously convolute 6 to 8 cm long, rigid, strongly striate, asperulous on both sides. Panicle contracted, few spiculate; glumes lanceolate usually unequal, membranous one-nerved, scaberulous above, tips hyaline, the lower 4 to 6 mm long, the upper 3 mm long; flowering glume cylindric, subemarginate, glabrous; awns disarticulating from the glume, distinctly stipitate, glabrous, jointed dividing in 3 bristles; the undivided part of the awn half the length of the bristles;

lodicules 1,27 mm long, few-nerved; anthers 5 mm long; grain oblong-cylindric, 2,5 mm long, whitish, finely grooved. — Flow. March.

D. a. mer. Wady Mreyk; Djebel Zebâra.

Also known from Nubia, Abyssinia, Erythraea and Arabia.

74. (3.) **Aristida funiculata** Trin. et Rupr. in Mém. Acad. Petersb. sér. 6. V (1842), p. 159. — Boiss. Fl. Or., p. 492. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 167 no. 1157. — Annual, in small compact tufts about 10 cm high; culms erect, very slender and short, geniculate glabrous, sheathed all along; leaves setaceous, convolute 3 to 6 cm long rigid, strongly striate, asperulous on both sides; ligule a fringe of soft, almost woolly cilia. Panicle contracted, few spiculate; glumes linear-lanceolate or linear, usually equal, setaceous, acuminate, membranous, one-nerved, tips hyaline. the lower glume 3 to 5 mm long, the upper 2 mm long; flowering glume cylindric, subemarginate, glabrous; awns disarticulating from the glume, distinctly stipitate, glabrous, jointed, dividing in 3 bristles; the undivided part of the awn about one-fifth of the length of the bristles; lodicules 2 mm long, few-nerved; anthers 4 mm long; grain oblong-cylindric, 2,5 mm long, whitish, finely grooved. — Flow. April and September to October. —

D. a. mer. Sherm Lûliyah, Wady Tundeba, Wady Etit. —

Also found in Nubia, Abyssinia, Arabia and Senegambia.

75. (4.) **Aristida obtusa** Del. Fl. d'Egypte I (1813), p. 175, tab. XIII. fig. 2. — Boiss. Fl. Or. V, p. 494. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 168 no. 1159. — Perennial, compactly caespitose with numerous innovation shoots; culms from a few centim. to 30 cm long, very slender. 1-noded, geniculate, glabrous, smooth, internodes exserted; lower sheaths short, firm, persistent, glabrous or woolly near the margin, upper tight; ligule a line of short hairs often passing into a long spreading beard at the mouth; leaves setaceous, convolute, 1 to 6 cm long, rigid, curved or flexuous, glaucous, glabrous, smooth beneath, minutely villous above; panicle very narrow, contracted, 2,5 to 12 cm long; branches solitary or 2-nate, erect, branched from the base or simple for 3 to 12 mm, filiform, scaberulous, near the tips; lateral pedicels short; spikelets 6 to 9 mm long, pallid; glumes equal or the lower slightly longer, the lower lanceolate, obtuse, 3-nerved, tip hyaline. the upper narrower, 1- to sub 3-nerved; flowering glume oblong-cylindric, broadly obovate when expanded, broadly emarginate, 2,5 mm long, smooth; callus 1 mm long; awn from the sinus, stipitate, foot straight or slightly twisted, very fine, 5 to 7 mm long; middle bristle up to 2 cm

long, dark, plumose above the middle feather rounded at the tip without excuring bristle; side bristles very fine, divaricate, up to 1 cm long, naked; pale nerveless, broad, 1 mm long; lodicules nerveless, slightly longer than the pale; anthers 5 mm long; grain subovate, terete, almost 1—2 mm long, whitish. — Flow. April to May.

D. a. sept. Gebel Amuna; Wady Dugla.

Local name: dereyry.

Also in South Africa, Hereroland and in the deserts of Arabia.

76. (5.) **Aristida ciliata** Desf. in Schrad. N. Journ. f. Bot. III (1809), p. 255. — Boiss. Fl. Or. V, p. 494. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 168 no. 1160. — Perennial, compactly caespitose, with numerous, usually short innovation shoots; culms geniculate, slender 30 to 60 cm long, glabrous, smooth, 2—3-noded, internodes exserted: sheaths crowded at the base, the lowest broad, whitish, firm. persistent, woolly near the margins below, the upper tight, long bearded at the nodes and at the mouths; leaves thick setaceous, convolute, those of the innovation shoots sometimes very short, recurved or like those of the culms up to 15 cm long, rigid, glabrous, smooth below, minutely hairy above; panicle narrow, oblong-linear, usually contracted and strict, 8 to 12 cm long; rhachis smooth; branches erect, solitary, often bifid near to or branched from the base; branchlets filiform, few-spiculate, tips clavate; lateral pedicels short; spikelets linear-oblong, 10 to 12 mm long, straw-coloured or purplish; glumes subequal, linear-oblong, emarginate, firm, 3-nerved, usually glabrous; flowering glume cylindric, 10 to 12 cm long, narrowed from below the middle into and jointed with a beak, beak conical below filiform and straight or twisted above; callus 2 mm long; awns deciduous with the beak, divaricate, plumose from the base, the side-bristles very fine, naked; pale 1 mm long, nerveless; lodicules few-nerved, 0,25 mm long; anthers 4 to 6 mm long; grain cylindric, truncate, 2 to 3 mm long; hilum as long as the grain. — Flow. April.

M. p. Bir el abd. — **D. l.** Khefren-Pyramid; Abu Roash. — **D. i.** Between Tell-el-Kebir and Sheykh Serhan; between Ismailia and Bir Abu Dafn. — El Arish. — **D. a. sept.** Bir-el-Fakhme (Great petrified forest). Upper Wady Dugla; Wady Hamata near the Gebel Ataka; Wady Ansuri; Upper Wady Om Ruthi, Southern-Galala. — **D. a. mer.** Wady Etit between Qoseyr and Ras Benass.

Also in Nubia and South Africa and throughout the southern part of the Mediterranean region. — Common on the sand-hills of the desert and almost characteristic of that country, growing in small bright green tufts, and most luxuriantly in localities, where one would say nothing could possibly exist.

77. (6.) **Aristida plumosa** L. Spec. Plant. ed. II (1762), p. 1666. — Boiss. Fl. Or. V, p. 495. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 168 no. 1161. — Perennial, compactly caespitose, with numerous, usually short innovation shoots. 30 to 50 cm. Sheaths of leaves and internodes tomentellous or woolly; ligule reduced to a rim of bristles. Panicle 10 to 20 cm long, 3 to 4 cm broad, loose; glumes glabrous, unequal, lanceolate, acuminate, the upper longer; flowering glume one-third as long as the empty glumes; awn naked; middle bristle 4 to 6 cm long, one-fifth naked, the rest feathery, three to five times as long as lateral bristles. — Flow. April to May.

D. l. Khefren Pyramid; Between Kharge and Esne; between Maraghi and Farâfrah. Four days journey West from the Oasis of Dakhel. — **D. i.** Tell-el-Kebîr. — **D. a. sept.** Gebel Ahmar near Cairo; Wady Haowashish; Way from Cairo to Suez, Ismailia; Gebel Shaluf; Wady Hamâta. — **D. a. mer.** Between Ok alet Abu Kuyeh and Wady Hamamât on sandy places.

Local name: gaba; shâ'arâysh; nesî; dereyry.

Also known from Nubia, Sinai, Syria and Palestine.

Numerous forms of this grass have been described by Walpers Ann. bot. IV (1852) 749, but I cannot, however, agree with him, and confine myself in this place to the statement, that all the Egyptian specimens represent more or less the typical form.

78. (7.) **Aristida brachypoda** Tausch in Flora (1836), p. 506. — Boiss. Fl. Or. V, p. 495. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 168 no. 1162. — Perennial tufted; 20 to 40 cm high; culms often tomentellous at the middle internodes. Sheaths of leaves glabrous; ligule reduced to a rim of bristles. Panicle narrow, 10 to 15 cm long, 2 to 3 cm broad; glumes glabrous, linear-lanceolate, obtuse, the upper longer; flowering glume hirsute at the base, one-fourth as long as the glumes, awn naked; middle bristle 3 to 5 cm long, one-fifth naked, the rest feathery, 2 to 4 times as long as lateral bristles. Flow. May to June.

D. l. Pyramids near Cairo; Step-Pyramid of Saqqâra. — **D. i.** Es-Sâlihiya; Ismailia, on sandy hills. — **D. a. sept.** Gebel ahmar, between Abasiya and Polygone. Near Bir Abu Ballah; Gebel Aowebet; Petrified Forest near Cairo; Upper Wady Dugla; Wady Rished near Helwan on stony ground.

Local name: sefsuf. —

Also known from Sinai.

79. (8.) **Aristida lanata** Forsk. Flor. aeg.-arab. (1789), p. LXI no. 79 and p. 25. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 168 no. 1163. — A. Forskâlei Tausch Flora (1836), p. 506. — Boiss. Fl. Or. V,

p. 496. — Perennial, tufted. 30 to 40 cm high. Sheaths of leaves glabrous; ligule reduced to a rim of hairs. Panicle linear, 10 to 15 cm long, 2 cm broad; glumes linear-lanceolate, acuminate, the lower glabrous, the upper longer, sometimes somewhat ciliate; flowering glume silky, one-fourth as long as the empty glumes, awn included, naked; all the bristles of awn more or less feathery, or one or both of the lateral naked, the lateral two-thirds to three-fourths as long as the intermediate. Flow. April to May.

M. ma. Mandara near Alexandria. in sandy places; Ramle, in deep sand. — **M. p.** Rosetta on sandy hills near the town; Damietta, in sandy fields.

Local name: dereyre; shafshûf; 'aîn sîle.

Also known from Sinai and Syria.

80. (9.) **Aristida caloptila** (Jaub. et Spach) Schweinf. in Boiss. Fl. Or. V (1884), p. 497. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 168 no. 1163. — *Arthratherum caloptilum* Jaub. et Spach Ill. Or. tab. 336. — Perennial, compactly caespitose, with numerous, usually short innovation shoots. Culms fascicled, erect and simple or branched, 15 to 25 cm high, 2—4-noded; sheaths rather tight, striate, glabrous, smooth or somewhat rough, lower pallid; ligule 1.5 to 2 mm long; leaves very narrow, linear-filiform or filiform, tapering to a very fine point, 4—10 cm long, up to 1.5 mm broad, convolute, rarely flat. Panicle linear-oblong, erect, contracted or somewhat open, 4—8 cm long, 1—2 cm broad; rhachis filiform, smooth or scaberulous; glumes equal or subequal, lanceolate or lanceolate-linear, obtuse; flowering glume linear-convolute, 2 to 4 mm long, produced into an often slightly exserted and more or less twisted almost solid scabrid beak; awns continuous with the glume, about 2 cm long; pale oblong, acute; lodicules about as long as the pale. — Flow. March to April. —

D. a. sept. Wady Mor; Wady Aaowashish; Wady Na' uk in the northern Galala; Gebel Shaluf.

Local name: nêsi.

Also known from Sinai and Arabia.

81. (10.) **Aristida hirtigluma** Steud. Nomencl. bot. ed. II, 1 (1840), p. 131. — Boiss. Fl. Or. V, p. 496. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 168 no. 1164. — Perennial, compactly caespitose, with numerous, usually short innovations shoots. Culms fascicled, erect and simple branched, 2—4-noded, usually glabrous, 20 to 40 cm high. Sheaths of leaves bearded in place of ligule. Panicle open, 15 to 20 cm long, 4 cm broad; glumes hirtellous, lanceolate, obtuse, the upper longer; lower glume with a plumose base, papillose-muricate,

as well as its stalk-like appendage; awn naked or hairy below the knee; the lateral bristles naked, one-fourth to one-third as long as the feathery middle one which is 6 to 7 cm long. Flow. March to April.

D. a. mer. Wady Mreyk Mirsa Zebara, Wady Gemâl; between Qoseyr and Ras-Benass, near the coast; near Qosur el Benat, between Legeta and Wady Hamammata.

Local name: jebah (Klunzinger).

Also found in Arabia and Erythraea.

82. (11.) **Aristida acutiflora** Trin. et Rupr. in Mém. Acad. Pétersb. sér. 6. vol. V (1842), p. 167. — Boiss. Flor. Or. V, p. 497. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 168 no. 1166. — Sickenberg. Contrib. Fl. d'Eg., p. 301. — 30 to 45 cm high. Sheaths of leaves short-ciliate at the mouth. Panicle elongated, contracted; glumes lanceolate, tapering-acuminate, the upper somewhat longer. 3-denticulate at tip; flower short, stalk-like appendage to lower pale long, appressed-sericeous, ciliate at the tip; the undivided part of the awn 3 mm long, naked, not geniculate; middle bristle 13 to 15 mm long, naked below, feathery at the middle, naked toward the tip, the lateral bristles setaceous, naked, half as long. — Flow. February to March. —

D. l. Khfren Pyramid near Cairo; Abu Selema near Edfu, between Kharge and Esne; in sandy places. — **D. a. sept.** Sandhills near Mghêta; between the Serapeum and Abu Ballah..

Local name: sakham.

Also known from Sinai, Syria and Palestine.

83. (12.) **Aristida Zittelii** Aschers. in Verhdlg. Bot. Verein Prov. Brandbg. XXI (1879), p. 70. — Boiss. Fl. Or. V, p. 497. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 168. p. 1167. — Sickenberg. Contrib. Fl. d'Eg., p. 301. — Perennial, densely caespitose, with an oblique rhizome, glabrous, branched from the base; culms tufted, geniculately ascending, slender, from 8 to 25 cm high; sheaths very tight throughout, striate, scaberulous; ligule densely ciliate; leaves linear, acute, involute, over 10 cm long, 1 mm broad near the base smooth below, asperulous above; panicle oblong, loose, 12 to 15 m long; branches fascicled scaberulous; spikelets numerous, yellowish 18 mm long; glumes equal, 8 to 9 mm long, acuminate, 3-nerved, scaberulous on the outer side, marginate, the lower 5 mm long, shortly mucronate, villous at the base; feather of the middle bristle of awn rounded at the tip; lodicules 0,5—0,75 mm long; anthers 0,5 mm long. — Flow. March to April. —

D. i. Between Cairo and the Fayûm; between Siut and Farâfra. Prof. Ascherson dry it up in great abundance between Farâfra and Dakhel. — **N. f.** Fayûm.

A quite distinct species, endemic in Egypt.

84. (13.) **Aristida pungens** Dsf. Fl. Atlant. I (1798), p. 109 tab. 35. — Boiss. Flor. Or. V, p. 498. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 168 no. 1168. — Perennial, glabrous; rhizome long, oblique with compact tufts of short barren shoots and culms. these erect or ascending, 20—30 cm high, simple, terete or compressed below, smooth, glabrous, many-noded; leaves rigid, pungent junciform, erect; ligule a line of short hairs; panicle ovate or linear, usually interrupted or oblong and more or less loose; glumes unequal, glabrous lanceolate to linear-lanceolate, acute, 3-nerved; flowering glume cylindric; deciduous with the beak, divaricate, plumose from the base, awns the lateral-bristles very fine, naked. — Flow. April to May.

O. Siwa. Little Oasis: Great Oasis; Gebel el Ter. — **D. i.** Pyramids of Giza; common in cotton fields. Kom-Ombo. Ruli near Sarnalut between Maragh and Farâfra: Bîr Kerawy.

Local name: Abu'r-rukbeh; shôk-el-ghazâl (Ascherson); haskanit. (Schweinf.).

Also known from Turkestan, Sibiria and Nubia.

85. (14.) **Aristida scoparia** Trin. et Rupr. in Mém. Acad. Petersbg. sér. 6 vol. V (1842), p. 176. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 168 no. 1169. — Sickenberg. Contrib. Fl. d'Eg., p. 301. — *Aristida pungens* var. *scoparia* Boiss. Fl. Or. V, p. 498. — Perennial, glabrous; rhizome long, oblique with compact tufts of short barren shoots and culms, these erect or ascending, 20 to 30 cm high, simple, terete or compressed below, smooth, glabrous, many-noded; leaves filiform, longer than in *A. pungens*, 20—30 cm long, rarely 10 cm long, junciform; ligule a line of short hairs; panicle ovate or linear, usually interrupted, loose; glumes unequal, glabrous, lanceolate to linear-lanceolate, acute, usually 3-nerved; flowering glume cylindric; awns deciduous with the beak, divaricate, plumose from the base, the la-bristles very fine, naked. — Flow. April to May.

M. p. Quqah and eastward. — **D. i.** Pyramids of Giza. — Pyramids of Zâwiyet-el-'Aryân. — **D. i.** Serapeum at Netish. — **D. a. sept.** Ismailia, in sandy places; in cottonfields. Khanka, Abu Zabel.

A quite distinct species, endemic in Egypt.

33. (16.) **Stipa** Linn.

Spikelets 1-flowered, narrow, paniculate; rhachilla disarticulating above the glumes, not produced. Glumes usually persistent, narrow,

1—2-nerved, mucicous or mucronate. Flowering glume convolute, cylindric or oblong-cylindric, 5—7- (rarely 3-) nerved, rather rigid, tip gradually tapering or minutely 2-lobed; callus more or less bearded, usually pungent; awn simple, continuous with or jointed on the flowering glume, bent or geniculate, twisted below, plumose or naked above the knee. Pale 2-keeled or 2-nerved, almost as long as the flowering glume or much shorter. Lodicules usually 3, the posterior smaller or suppressed. Stamens 3, rarely fewer. Ovary glabrous; styles distinct, short; stigmas plumose. Grain slender, cylindric or oblong-cylindric, terete or subterete, sometimes grooved, tightly embraced by the hardened glume and the pale; hilum linear, almost as long as the grain; embryo rather small. — Tufted annual or perennial grasses. Leaves usually convolute, rarely flat. —

A genus of over 100 species, spread over the temperate and tropical regions of both hemispheres. —

A. Glumes unequal, small

I. Panicle diffuse, 15 to 18 cm long, awn not geniculate at the middle 1. *S. parviflora*.

II. Panicle contracted, 10 cm long, the dilated sheath of the upper leaf forming an involucre, awn geniculate at the middle 2. *S. tortilis*.

B. Glumes equal, panicle erect 3. *S. gigantea*.

86. (1.) *Stipa parviflora* Desf. Fl. Atlant. I (1798), p. 98 tab. 29.

Boiss. Fl. Or. V, p. 499. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 169 no. 1179. — Sickenberg. Contrib. Fl. d'Eg., p. 301. — Perennial, tufted; culms erect or geniculate, very slender, from 10 cm to 40 cm high; with a few intravaginal branches from the lower nodes, nearly naked, 3—5-noded, glabrous, internodes enclosed or the uppermost exerted; sheaths rather loose, glabrous, smooth, the uppermost often tumid; ligules ciliolate; leaves linear, tapering to a fine point, 10 cm long, convolute or flat, glabrous; panicle diffuse, 15 to 20 cm long; branches fascicled, very unequal, scaberulous, simple or almost so, up to 8 mm long; pedicels shorter than the spikelets, these very narrow, pallid; glumes hyaline-membranous, unequal, 1-nerved, the lower slightly shorter, tapering into an awn 1 to 1.5 cm long; flowering glume hairy at the base, appressed-hirsute at the tip, awn 3 to 10 cm long, capillary, puberulent-scabridulous; lodicules 2, oblong-lanceolate, up to 1 mm long; anthers 0.5 mm long, scantily ciliolate; grain subcylindric, 3 mm long. — Flow. April to May.

M. ma. Ras el Kanaïs: — near Alexandria, in sandy places; Mariut, in sandy fields near the old Palace of Saïd Pasha. —

D. a. sept. Wady el Abiad, northern Galala; Wady Na'uk, northern

Galala; Wady Hamáta near Gebel Ataqah; Upper Wady Dugla; Upper Wady Rigbe; Wady Tin. —

Local name: bihme.

Also known from the western regions of Northern Africa.

87. (2.) ***Stipa tortilis*** Desf. Fl. Atlant. I (1798), p. 99 tab. 31 fig. 1. — Boiss. Fl. Or. V, p. 500. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 169 no. 1171. — Annual, tufted; culms erect or geniculate, very slender, from 15 to 40 cm long, with a few intravaginal branches from the lower nodes, 1—3-noded, glabrous or reversedly hairy, internodes enclosed or the uppermost exerted; sheaths rather loose, glabrous, smooth, the uppermost often tumid and embracing the base of the panicle; ligules, ciliolate, up to 0.6 mm long; blades linear, tapering to a fine point, 4 to 14 cm long, 2.5 mm broad, convolute or flat, glabrous below, more or less hairy above or hairy all over; panicle spike-like, very narrow, 2 to 12 cm long, straight; branches fascicled, very unequal, scaberulous, simple or almost so, up to 8 mm long; pedicels shorter than the spikelets, these very narrow, 12 to 18 mm long, pallid, shining; glumes very narrow, linear-lanceolate to linear, acuminate, whitish, hyaline, 1-nerved (with 2 fine short lateral-nerves at the base), the lower slightly shorter; flowering glume cylindric, tightly convolute, callous tipped, 4 mm long, pubescent, 5—7-nerved; callus 2.5 mm long, minutely bearded; awn disarticulating 4 to 7 cm long, geniculate at the middle, strongly twisted below, hispidulous; pale broadly oblong, obtuse, 1.75 mm or more; lodicules 2, oblong-lanceolate, up to 1.75 mm long; anthers 2.5 to 3 mm long, scantily ciliolate; grain subcylindric, 3 mm long. — Flow. April to May.

M. ma. Mex, in sandy places; Matruqa; common on the western end of the Lake Mariut, in deep sand; Ramle, in sandy places. — **D. i.** Pyramids of Giza; Kafûr Rahim near the Pyramids. — **D. i.** Mahsama. Es-Salihya. — **D. a. sept.** Massara near Cairo; Wady Rished, Wady Hof, Wady Dugla near Helwan; Wady Tin, Wady Azkhar; Wady Khafura; Shaluf. Wady Furn. —

Local name: bihme.

Also known from the western parts of North Africa.

88. (3.) ***Stipa gigantea*** Lag. var. ***pellita*** Trin. et Rupr. in Mém. Acad. Pétersb. sér. 6, vol. V (1842), p. 71. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 169 no. 1172. — Sickenberg. Contrib. Fl. d'Eg., p. 307. — Annual, tufted; culms erect or geniculate, very slender from 5 to 25 cm high, glabrous or usually scaberulous; sheaths rather loose, glabrous smooth, the uppermost often tumid. Leaves linear, tapering to a fine point, 5 to 10 cm long, 1—2 mm broad, convolute or flat, glabrous below, more or less scaberulous above;

panicle erect, 20 to 30 cm long, pedicels shorter than the spikelets, these pallid, shining; glumes equal, linear or linear-lanceolate, acuminate, whitish, hyaline, 2-nerved; flowering glume lanceolate, tightly convolute, callous tipped, 2 mm long; lodicules 2, oblong-lanceolate, scantily ciliolate. — Flow. April to May.

M. ma. Mex; Coast of Marmarica. Alexandria: — **D. i.** Gebel Ekhsen.

Also known from Algeria and Marocco and Spain.

34. (17.) *Oryzopsis* Michx.

Spikelets ovoid or lanceolate, usually awned, loosely paniced; rachilla disarticulating above the glumes, not continued beyond the flower. Flower 1, bisexual, shorter than the glumes. Glumes equal or subequal, persistent, usually acute or subacuminate, thin, 3--9-nerved, lateral-nerves often very short. Flowering glume convolute, more or less flattened from the back, ovate to obovate or lanceolate, 5- very rarely 3-nerved, rather rigidly membranous to coriaceous, tips obscurely 2-lobed; callus very short and broad, obtuse; awn (if present) from the minute sinus of the tip, jointed on the flowering glume and easily deciduous, bristle-like, naked. Pale almost as long as the glume or rather shorter, 2-nerved. Lodicules 2, rarely 3, hyaline. Stamens 3. Ovary glabrous; styles distinct, short, stigmas plumose, laterally exerted. Grain tightly enclosed by the hardened glume and pale, oblong, ovoid or ellipsoid or obovoid, terete; embryo small; hilum filiform, shorter than the grain, often obscure. — Perennial, tufted; leaves linear, usually long, flat, flaccid; ligules membranous; panicles effuse or more or less contracted, always very loose, often nodding. —

A genus of about 16 species distributed throughout the northern hemisphere.

89. *Oryzopsis miliacea* (L.) Aschers.-Schweinf. Ill. Fl. d'Eg., p. 169 no. 1173. — *Agrostis miliacea* L. Spec. Plant. I, p. 61. — *Piptatherum miliaceum* Coss. Plant. crit., p. 129. — Boiss. Fl. Or. V, p. 506. — Perennial, loosely tufted; rhizome short, thick, innovation buds short, extravaginal, covered with silky scales; culms erect, slender or more or less robust 15 to 90 cm long, smooth, glabrous, 4--5-noded, internodes more or less exerted; sheaths tight or somewhat loose, finely striate, glabrous excepting the lowest bladeless ones (innovation scales), smooth, lower at length dry and scarious; ligules very short, truncate or the uppermost oblong and up to 2--3 mm long; leaves linear, long tapering to a setaceous point, up to 30 cm long, 2.5--8 mm broad, flat and flaccid or rolling up when dry, more or less glaucous, glabrous or finely hairy on the upper side, smooth

beneath, scaberulous above or all over in the upper part; panicle large, oblong to linear, open or contracted, more or less nodding, 15 to 35 cm long, axis very slender, terete; branches few to very numerous in distant semiwhorls, finely filiform to capillary, scaberulous, lower 4 to 10 cm long, often undivided to $\frac{1}{2}$ their length from the base; branchlets few, subracemose, contracted; pedicels very unequal, the lateral ones usually very short; spikelets oblong-lanceolate, greenish or tinged with purple, 2—3.5 mm long; glumes acuminate, rather broad when expanded, 3- to sub 5-nerved, lateral nerves very short; flowering glume obovate to oblong, 2.5 mm long, smooth, glabrous, rigidly membranous, whitish, 3-nerved; awn a very fine and caducous flexuous bristle, 2.5 to 4.5 mm long; lodicules 2, oblanceolate; anthers 1.75 mm long, tips very minutely penicillate; grain ob-ovoid-oblong, over 2 mm long, terete. — Flow. April.

M. ma. Alexandria, Gabari, Mariut. — **N. d.** Damietta, on the embarkements of canals. In old Arabic gardens of Cairo. — **D. a. sept.** Wady Hamâta and Khafûra near Gebel Atâqa; Wady Natfe; Wady Tin; Wady Az-khar; Upper Wady Dugla.

Local name: hemâr.

Also known from the whole Mediterranean region, Arabia Petraea and the North Atlantic Islands.

35. (18.) *Heleochloa* Host.

Spikelets 1-flowered, short-pedicelled, densely spiked along a cylindrical axis. Glumes membranous, with a green, scabrous keel, somewhat shorter than the sessile flower, nearly equal. Flowering glumes similar to empty glumes, muticous, somewhat longer, 1-nerved, keeled, the pale 2-nerved. Stamens 3. Styles 2, terminal, long; stigmas plumose. — Annuals, with aspect of *Crypsis*.

A small genus of about 8 species in the Mediterranean region and in the temperate Asia and Europa.

- A. Culms forming a hemispherical tuft; upper leaves with much dilated sheaths 1. *H. schoenoides*.
- B. Culms usually simple; upper leaves with little dilated sheaths 2. *H. alopecuroides*.

90. (1.) *Heleochloa schoenoides* (L.) Host Gram. Austr. I (1801), p. 23 tab. 30. — Boiss. Fl. Or. V. p. 476. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 167 no. 1152. — *Phleum schoenoides* L. Spec. Plant. ed. I. p. 60. — *Crypsis schoenoides*. — Hochst. ex Steud. Syn. Plant. Gram., p. 152. — *Crypsis niliaca* Fig. et. De Not. in Mém. Acad. Torin; ser. 2 XIV, p. 322. — Culms forming a hemispherical tuft. Upper leaves with much dilated open sheaths. Spikes ovate-

oblong to oblong cylindrical, 1.5 to 4 cm long, 6 to 9 mm thick, with an involucre of 1—2 of the upper leaves; glumes acute, equal, membranous, with a green scabrous keel, somewhat shorter than the sessile flower. Pales similar to the glumes, mucicous, somewhat longer, the lower 1-nerved, keeled, the upper 2-nerved. Stamens 3. Styles 2, terminal, 3 to 6 mm long; stigmas plumose. — Flow. April to May.

M. ma. Alexandria. — **N. d.** Tell-el-Kebîr; Semenut; Es-Sâlihiya. Environs of Cairo; Shubra; banks of the Nil near Giza. — **N. f.** Médinet-el-Fayûm. — **N. v.** Pyramids of Giza; Abu Girge; Siut; Marag; Akhmîm. Banks of the Nile at Deheyneh near Kene; between Beni-Suef and Minia; fields near Esne. — **D. a. mer.** Qoseyr.

Local name: baqaq (Ascherson) baqôq; hosâd (Klunzinger).

Also found in the other parts of the Mediterranean region and in Asia and Siberia.

91. (2.) **Heleochloa alopecuroides** (Schrad.) Host Gram. Austr. I (1801), p. 23 tab. 29. — Boiss. Fl. Or. V, 476. — Aschers-Schweinf. Ill. Fl. d'Eg., p. 167 no. 1153. — Crypsis alopecuroides. Hochst. ex Steud. Syn. Plant. Gram., p. 152. — 4 to 10 cm high; culms usually simple, geniculate-ascending. Sheaths of the upper leaves cylindrical, little dilated. Spikes oblong to cylindrical, 1 to 3 cm long, 3 to 4 mm broad, often at some distance from upper sheath; glumes glabrous, except at the ciliate-scabrous keel, rather obtuse, somewhat unequal, membranous, with green scabrous keel, somewhat shorter than the sessile flower. Pales mucicous. Stamens 3. Styles 2, terminal, 3 to 6 mm long; stigmas plumose. — Flow. March to April.

M. ma. Alexandria; Mariut. — **M. p.** Port Said. — **N. d.** Near Tanta, not rare; environs of Cairo. — **N. v.** Siut, in fields.

Local name: baqôq.

Also known from Europe und Asia.

36. (19.) **Sporobolus** R. Br.

Spikelets usually very small, variously paniced, continuous on the pedicels; rachilla more or less readily disarticulating above the glumes, not continued, or very rarely produced into a bristle. Flower 1, bisexual. Glumes 2, delicately membranous, lower usually smaller, nerveless, upper 1-nerved, falling away one after the other. Flowering glume more or less resembling the upper glume, 1-nerved or more or less distinctly 3-nerved. Pale usually almost as long as the flowering glume; 2-nerved, folded between the nerves, often split by the maturing grain. Lodicules 2, small, broadly cuneate, glabrous,

thin. Stamens 3, rarely 2. Ovary glabrous; styles short, distinct, terminal, stigmas plumose or subaspergilliform. Grain free, falling out or retained and dehiscing; pericarp thin, usually swelling in water, rigid, dehiscing, or the inner layers mucilaginous when wetted, and adherent, or the whole pericarp adnate and indistinct; hilum small, punctiform, basal; embryo rather large. — Annuals or perennial of various habit; ligules reduced to a ciliate or ciliate rim; panicles contracted to spike-like, or more or less open, sometimes extremely loose; spikelets mostly 0.75 to 2 mm long.

Species about 80, dispersed through the tropical and subtropical regions of both hemispheres, but most numerous in America.

- A. Leaves crowded at neck and nodes of stolons; sheaths open; blades linear, panicle very tight and narrow, peduncled above the uppermost leaf 1. *S. spicatus*.
- B. Leaves densely 2-ranked; sheaths enclosing one another; blades lanceolate pungent at the tip panicle sheathed by uppermost leaves 2. *S. pungens*.

92. (1.) **Sporobolus spicatus** (Vahl) Kunth Rev. Gram. I (1829), p. 67. — Boiss. Fl. Or. V, p. 512. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 169 no. 1175. — Sickenberg. Contrib. Fl. d'Eg., p. 301. — Vilfa spicata P. Beauv. Essai Agrost., p. 16. — Agrostis virginica Forsk. (non L.) Fl. aeg. arab., p. 20. — 10 to 30 cm high; stolons naked. Leaves crowded at neck and nodes of stolons. sheaths open, blades linear, involute, pungent, scabrous at the margins, pubescent at the upper side, glabrous at the lower surface, those of geniculate culms with long sheath and short blade. Panicle long-peduncled, 5 to 6 cm long, 2 mm broad; glumes glossy, the lower one-third as long as the upper, hyaline, ovate, obtuse, the upper lanceolate, acute, flowering glumes equal, as long as the upper glume or a little longer. — Flow. March to May. —

M. ma. Alexandria, margin of fields; in sandy places near Ramle and Mandara. — **M. p.** Rosetta, in sandy places; Abu-Mandur, in deep sand very common; Damietta Kôm Mastara, not rare. — **D. i.** Near Bîr Abu-Balah. — **D. l.** 'Ain Rajân, s. w. from the Payûm. — **O.** Great Oasis; 'Ain Taul; Little Oasis: 'Ain Musaffir, 'Ain Me'allagar, not rare. — **D. l.** Beni Adi near Siut, margin of the desert; Pyramids of Gîza; in fields near Abydos, not rare. — **D. i.** Ismailia, in sandy places not rare; Es-Sâlihiya in sandy places. — **D. a. sept.** Environs of Cairo, Gebel aḥmar; Moqattam mountains.

Local name: negîl (Ascherson); sakham (Ascherson); albristi. Also known from Nubia, Abyssinia and Arabia.

93. (2.) **Sporobolus pungens** (Schreb.) Kunth. Rev. Gram. I (1829), p. 68. — Boiss. Fl. Or. V, p. 512. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 169 no. 1174. — *Agrostis pungens* Schreb. Beschreib. Graes. II, p. 46 tab. 27 fig. 3. — *Vilfa pungens* Beauv. Essai Agrost., p. 16. — *Phalaris disticha* Forsk. Flor. aeg.-arab., p. 17. — Perennial; rhizome often long creeping, stoloniferous; stolons emitting fasciated or solitary ascending culms, these 4 to 30 cm high, glabrous, very many-noded, sheathed early all along, internodes alternately very short and long, hence the leaves appear opposite; culm-sheaths rather tight, slightly compressed, glabrous or sometimes ciliate along the margins and bearded at the mouth, smooth; ligule a ciliate rim; blades subulate-involute, often pungent, rarely flat towards the base, from 0.75 to 12 cm long, rigid, firm, closely and strongly nerved, glabrous or scantily long-hairy above, margins scaberulous; panicle spike-like, oblong-ovate, compact, rarely somewhat loosened, 1.27 cm to 2 cm long; branches short, branched from the base, scaberulous; pedicels very short; spikelets light to dark olive-green, 2 to 3 mm long; glumes lanceolate, acute or acuminate, keels acute, scaberulous above, the lower equalling $\frac{1}{2}$ — $\frac{4}{5}$ of the upper, the latter as long as the glume or slightly longer and like it 1-nerved; pale slightly shorter; stamens 3; anthers 1.2 to 2.5 mm long; grain ellipsoid, light brown; pericarp thin. — Flow. April to May.

M. ma. Alexandria. — **M. p.** Rosetta; Kafr Soliman. — **D. a. sept.** Kanka, Bishet-el-hady.

Local name: sammah (Muschler).

Also known from Senegal.

37. (20.) **Polypogon** Desf.

Spikelets 1-flowered, in dense spike-like, often lobed, panicles, disarticulating from the pedicels; rachilla disarticulating below the flowering glume, not produced; flower bisexual. Glumes 2, subequal, awned from the entire or 2-lobed tips. Flowering glume shorter than the glumes, very thin to hyaline, glabrous, truncate, faintly or obscurely 5-nerved, the lateral nerves shortly excurrent or evanescent within the hyaline tips; awn very fine, usually deciduous, subterminal, sometimes reduced to a mucro or 0. Pale 2-keeled, slightly shorter than the glume, rarely much shorter. Lodicules 2, delicate. Stamens 3. Ovary glabrous; styles distinct, very short; stigmas laterally exerted, loosely plumose. Grain oblong, subterete or slightly grooved, enclosed by the unaltered glume and pale; hilum short; embryo small. — Annual or subperennial; blades flat, uppermost sheath often tumid; spikelets 2 to 5 mm long; often hidden by the numerous awns.

Species about 8; 4 in America, 1 in Africa, the others widely dispersed over the warm regions of both hemispheres.

- A. Glumes scabrous-pubescent, entire; awn thrice as long as the glume; flowering glume half as long as the empty glume 1. **P. monspeliensis**.
- B. Glumes on the back beset with silvery scales below, bifid; awn four times as long as the glume; flowering glume one-third as long as the empty ones 2. **P. maritimum**.

94. (1.) **Polypogon monspeliensis** (L.) Desf. Flor. Atlant. I (1798), p. 69. — Boiss. Fl. Or. V, p. 520. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 169 no. 1178. — *Alopecurus monspeliensis* L. Spec. Plant. I, p. 61. — *Phalaris cristata* Forsk. Flor. aeg.-arab., p. 17. — Annual tufted, culms erect or geniculately ascending, 15 to 60 cm long, simple glabrous, smooth, 3—4 noded, nodes exerted or enclosed; sheaths loose, often tumid, glabrous, smooth; ligules scarious, oblong, denticulate, ciliate, 2 to 7 mm long; blades linear, tapering to a callous point, 4 to 12 cm by 2 to 7 mm, flaccid to subrigid, flat, scabrid; panicle spike-like, cylindric, sometimes lobed or interrupted below, 2 to 6 cm long, light, green or straw-coloured; branches with numerous branchlets from the base, scaberulous; lateral pedicels extremely short, disarticulating near the base; spikelets 2.5 mm long; glumes subequal, linear or oblanceolate-oblong, shortly 2-lobed or emarginate, scaberulous, ciliate or ciliate; awn 4 to 6 mm long; flowering glume 1 mm long, minutely 2—4-mucronulate, nerves very obscure, awn as long as the glume or shorter or 0; pale 2-toothed or 2-mucronulate, almost as long as the glume; anthers 0.3 mm long; grain oblong, 0.75 mm long, subterete or terete, obscurely grooved. — Flow. March to April.

M. ma. Alexandria; Ramle. — **M. p.** Rosetta, in sandy places. — **N. d.** Tukh; Damietta; Belbês; San; Environs of Cairo, common. — **N. f.** Medînet-el-Fayûm; Tomia; Senhûr. — **N. v.** Esne, in sandy places and bords of the Nil. — **O.** Great and Little Oasis. — **D. l.** Pyramids of Saqqâra. — **D. i.** Ismailia, in sandy places. — **D. a. sept.** Helwan everywhere in sandy places. — El Araiide. 'Ain Musa. —

Local name: zera-el-fur (Ascherson).

Also known from the other parts of Northern Africa and from Abyssinia.

95. (2.) **Polypogon maritimus** Willd. Neue Schrft. Ges. Naturforschend. Freunde Berlin III (1801), p. 443. — Boiss. Fl. Or. V, p. 520. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 169 no. 1179. — Annual, tufted, 5 to 20 cm high. Panicle spike-like, oblong, 1 to 4 long, 0.8 to 1 cm thick; glumes equal, the back beset with silvery scales below, ciliate-margined, oblong-cuneate, bifid, the awn arising from

the sinus, four times as long as the glume; flowering glume one-third as long as the empty ones, apex 4-toothed; muticous. — Flow. February to May. —

M. p. Rosetta.

Local name: dheil-et-taleb.

Also known from other parts of Northern Africa.

38. (21.) **Agrostis** Linn.

Spikelets from less than 2 mm to 6 mm long, panicle; rachilla not continued beyond the flower or produced into a minute point or short delicate bristle, glabrous or shortly hairy. Flower 1, bisexual, shorter than the glumes. Glumes equal or subequal, usually lanceolate and acute, rarely oblong and obtuse, awnless membranous, usually 1-nerved, keeled. Flowering glume broadly oblong, delicately membranous, glabrous or hairy, usually truncate, 5- (rarely 3-) nerved, awned from the back or awnless; side-nerves evanescent below, often excurrent into fine mucros or bristles; callus very small, glabrous or minutely hairy or rarely bearded. Pale delicate, hyaline, usually shorter than the glume or very short or obsolete, 2-nerved or nerveless. Lodicules 2, lanceolate, delicately hyaline. Stamens 3. Ovary glabrous; styles distinct, very short; stigmas plumose, laterally exserted. Grain free, enclosed in the scarcely altered flower, oblong, more or less dorsally compressed, grooved in front, rarely subterete; embryo short; hilum punctiform; basal. — Annual or perennials, of varying habit; blades usually flat, often flaccid; ligules membranous; panicle usually much divided, often delicate, more or less effuse or contracted, rarely spike-like; branches and branchlets fine to very fine; spikelets usually very numerous, much gaping, at least temporarily.

Species numerous, all over the world, but mostly in the temperate regions. —

96. **Agrostis verticillata** Vill. Prosp. Fl. Dauph. (1779), p. 16. — Boiss. Fl. Or. V, p. 513. — Aschers.-Schweinf. Ill. Fl. d'Ég. p. 169 no. 1176. — Perennial, 30—60 cm high; culms geniculate, ascending or erect, sometimes rooting from the lowest nodes, glabrous like the whole plant, many-noded, internodes usually enclosed or shortly exserted; sheaths rather loose, smooth, strongly striate; ligules scarious, 2—3 mm long, ciliolate; blades linear, tapering to an acute point, 4—10 cm long 2—6 mm broad, glaucous, flat, flaccid or subrigid, often spreading at right angles, smooth below, scabrid on the upper surface, finely but prominently nerved; panicle erect, more or less spike-like, interrupted or lobed. 2—7 cm long, very

dense; branches fascicled, unequal, longest to 1 cm long, rarely longer, scabrid, branched from the base, straight; pedicels usually very short; spikelets greenish, 0.75 mm long; rhachilla not or very obscurely produced; glumes subequal, oblong, subacute or obtuse, minutely mucronulate or emarginate, scaberulous, keels scabrid, margins minutely ciliate; flowering glume broadly oblong, 2 mm long, truncate, minutely denticulate or ciliate, smooth, very faintly 5-nerved, awnless; pale almost as long as the glume, hyaline, obscurely 2-nerved, obtuse, tip ciliate; anthers apiculate, 0.75 mm long; grain broadly obovoid, terete, 1 mm long. — Flow. April to May.

M. ma. Alexandria, in fields. — **N. d.** in rice-fields and on bords of the canal near Alexandria; Ramle, in fields. — On the sides of irrigation-canals everywhere in the environs of Cairo; Damanhur, common in ricefields. — **N. v.** Atfih, in fields; Beni Suëf. Minia in fields; Feshan in Arabic gardens as a weed. — **D. a. sept.** Suez, 'Ain Musa.

Local name: na'im (Forsk.).

Also known from the other parts of Northern Africa, from Erythraea and Arabia.

39. (22.) *Calamagrostis* Roth.

Spikelets very narrow, lanceolate, acuminate, in contracted much divided panicles; rhachilla disarticulating above the glumes, not or shortly continued beyond the flower. Flower 1, bisexual, much shorter than the glumes. Empty glumes equal or subequal, very narrow, linear-lanceolate, acuminate, membranous, keeled, lower 1-, upper 3-nerved. Flowering glume narrow, lanceolate in profile, membranous, glabrous, more or less shortly bitid, 5—3-nerved with a fine short dorsal, rarely subterminal, awn; callus small, long hairy, hairs usually much exceeding the glume. Pale 2-nerved, as long as the glume or somewhat shorter. Lodicles 2, hyaline. Anthers 3. Ovary glabrous; styles distinct, short; stigmas plumose, laterally exerted. Grain enclosed by the hardly changed flowering glume and pale, free, subterete; hilum basal, small; embryo small. — Perennial, usually rather robust; blades long, linear, flat; ligules scarious; panicle more or less contracted, narrow, rather dense, with much divided branches, and short branchlets and pedicels; flower surrounded by long fine hairs.

Species few, in the temperate regions of the northern hemisphere; 1 also in South Africa.

97. *Calamagrostis arenaria* (L.) Roth Tent. Flor. Germ. I (1788), p. 34. — var. *australis* (Mabille) Ascherson and Schweinf. Ill. Fl. d'Eg. (1887), p. 169 no. 1181. — Sickenberg. Contrib. Fl. d'Eg.,

p. 302. — *Psamma australis* Mabilie Recherch. pl. Cors. 1 fascic., p. 33. — *Ammophila arenaria* Link Hort. bot. Berol. I (1827), p. 105. — 1 m or more high, growing in clumps from a creeping, woody root-stock. Leaves long, involute, sharp pointed. Panicle 25 to 30 cm long, 1.5 to 2 cm broad; glumes and pale about 1 cm long; mucro of the flowering glume as long as teeth. — Flow. March to April.

M. ma. Abusîr; Alexandria. —

Distributed in Europe and America.

40. (23.) *Triplachne* P. Beauv.

Spikelets 1-flowered. Panicle contracted into a somewhat loose tapering spike. Empty glumes with an enlarged ventricose shining base, very acute above, obscurely keeled, the lower longest. Flowering glumes less than $\frac{1}{4}$ as long as the empty ones, minutely hairy at the base, very thin, truncate and dentate at the apex. Awn slender, arising just below the tip, equalling or exceeding the glumes. Pale equalling to the flowering glume. Lodicules 2, linear, as long as the ovary. Stamens 3. Stigmas 2, subsessile. — Annual small herbs.

A small genus of only one species in the Mediterranean region.

98. *Triplachne nitens* Link. Hort. bot. Berol. II (1833), p. 24. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 169 no. 1177. — *Gastridium nitens* Coss. et Dur. ex Coss. Ann. sc. nat. sér. 4, I (1854), p. 229. — Boiss. Fl. Or. V, p. 519. — *Agrostis nitens* Guss. Flor. Sic. I, p. 59. — Culms slender, tufted, usually geniculate. Leaves linear-lanceolate or linear, 5—8 cm long, 3—5 mm broad; panicle spike-like, tapering at both ends, 5 to 10 cm long, 3 to 6 mm broad, looser in flower, contracted in fruit; glumes lanceolate, acuminate, unequal, scabrous at the keel; flowering glume villous, obtuse.

M. ma. Marabu near Alexandria; Mex near Alexandria in sandy places; Ramle, not rare; Abukîr, Montaza.

Also known from Western North Africa, Spain, Cilicia and Cyperus.

41. (24.) *Lagurus* Linn.

Spikelets laterally compressed, in compact spike-like softly villous panicles; rachilla disarticulating above the glumes, more or less continued beyond the flower, terminating with or without a rudimentary glume. Flower 1 (very rarely 2), bisexual shorter than the glumes. Glumes subequal, very narrow, gradually attenuate into a bristle, hyaline, plumose. Flowering glume membranous, long

acuminate, 5-nerved, tips 2-setose, finely awned from the back; callus small, minutely hairy. Pale 2-nerved, somewhat shorter than the glume. Lodicules 2, hyaline. Stamens 3. Ovary glabrous; styles distinct, short; stigmas plumose, laterally exserted. Grain linear-oblong, laterally compressed, tightly enclosed by the slightly hardened flowering glume; hilum basal, linear-oblong, very short, embryo small. — Annual; blades flat ligules membranous; panicle spike-like, compact, oblong to almost globose, softly villous from the plumose glumes.

Species 1, in the Mediterranean countries.

99. **Lagurus ovatus** L. Spec. Plant. I (1753), p. 81. — Boiss. Fl. Or. V, p. 521. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 169 no. 1180. — Annual; culms fascicled, suberect or geniculate, ascending, from a few cm to more than 30 cm long, very finely tomentose or pubescent (at least below the panicle), few-noded; upper internodes exserted, uppermost very long and slender; leaves finely tomentose or villous all over; sheaths loose or the upper tumid, lower membranous, white; ligules obtuse, decurrent, hyaline, pubescent; blades linear to linear-lanceolate, acute, very variable in size, from 2 to 14 cm by 2—14 mm, flat, margins often wavy; panicle oblong or ovate to globose, compact, 1 to 5 cm long; branches, branchlets and pedicels puberulous or scaberulous; spikelets imbricate, 4 to 6 mm long; the continuation of the rachilla pubescent; glumes linear-lanceolate, white, plumose from the base to the tops of the bristles; flowering glume linear lanceolate, long and finely acuminate in profile, 4 to 10 mm long, glabrous, awned from the middle; awn fine, 8 to 14 mm long; anthers 2 mm long; grain 3 mm long. — Flow. March.

M. ma. Mariut; Mex; Alexandria; Ramle; Abukîr. — **N. d.** Rosetta, in fields.

Distributed in the Mediterranean countries.

42. (25.) **Crypsis** Ait.

Spikelets 1-flowered, subsessile in hemispherical to oblong heads, on a disk-shaped or short-linear axis. Glumes 2, membranous, nearly equal, somewhat shorter than the flower, with a scabrous keel. Flower short-stalked between the glumes. Flowering glumes similar to the empty ones, somewhat longer, 1-nerved; the pale 3-nerved. Stamens 2. Styles 2, terminal, elongated. — Annual, tufted herbs, with heads subtended by an involucre of the dilated sheaths of the upper 2—4 leaves; the uppermost blade continuous (not articulated with the sheath).

Species 1, in the Mediterranean countries.

100. **Crypsis aculeata** (L.) Ait. Hort. Kew. ed. 1, I (1789), p. 48. — Boiss. Fl. Or. V, p. 475. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 167 no. 1151. — Schoenus aculeatus L. Spec. Plant. ed. I, p. 42. — Annual, 5—60 cm high; culms spreading on the surface of the ground and forming a flattened-hemispherical clump. Sheaths of leaves dilated, open, shorter than the internodes; leaves glaucous, spreading, tapering to an awn-shaped tip. Heads 5—10 mm long. — Flow. March to April.

M. ma. Mandara; Abusir; Alexandria, in sandy places; Ramle. —

M. p. Damietta, in fields and in sandy places. — **N. d.** Alexandria: Canal; San; Sâlihiya; Tanta; Menuf. — **N. f.** Mouth of the bahr Wady Fayûm. — **D. i.** Abu Roash near Cairo.

A species found everywhere in the Mediterranean countries.

43. (26.) **Alopecurus** Linn.

Spikelets 1-flowered, flat and densely crowded into a cylindrical spike or rather spike-like panicle. Outer glumes boat-shaped, with a prominent keel, but not awned. Flowering glume shorter, with a very slender awn inserted on the back, sometimes concealed under the outer glumes. Pale entirely wanting. — Annual or perennial herbs. Leaves small linear or lanceolate.

A small genus, widely spread over the temperate and colder regions of both the northern and southern hemispheres.

101. **Alopecurus myosuroides** Huds. Flor. Angl. ed. I (1762), p. 23. — Alopecurus agrestis L. Spec. Plant. ed. II (1762), p. 89. — Boiss. Fl. Or. V, p. 485. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 167 no. 1154. — An annual, 15 to 60 cm high, erect or slightly decumbent at the base. Leaves rather short, with long, not very loose sheaths. Spike 4 to 6 cm long, thin and pointed; spikelets numerous and flat, 5 to 7 mm long, usually quite glabrous; the two outer glumes united to about the middle, 6 mm long, glabrous or nearly so; the hairlike awn of the flowering one projecting 4 or 6 mm beyond them. — Flow. March.

N. f. In the Fayûm at different places.

A common grass in Europe and Asia.

44. (27.) **Weingaertneria** Bernh.

Spikelets with 2 fertile flowers, the lower sessile, the upper stipitate. Glumes scarious, boat-shaped, keeled, nearly equal, longer than the flowers. Flowering glumes scarious, nearly equal to the pales, aristate from its base, the awn jointed at its middle, the lower joint twisted, blackish, ending opposite the tip of the glume, in a bearded disc, from which arises the slender upper joint, ending

in a club-shaped tip. Stigmas 2, sessile, feathered. — Annual herbs, with long, spike-like panicles. —

A small genus of only 3 species in Europe.

102. **Weingaertneria articulata** (Desf.) F. Schultz in Arch. de Flore, March 1869. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 179 no. 1182. — *Aira articulata* Desf. Fl. Atl. I, p. 70. — *Corynephorus articulatus* Parl. Fl. It. I, p. 249. — Annual, 15—30 cm high; culms slender. Leaves convolute-setaceous. Panicle erect, 10 cm long, spreading during flowering, contracted before and after; branches capillary, several times trichotomous. Spikelets short-pedicelled; glumes greenish and reddish. — Flow. February to March. —

M. ma. Mariut; Mex; Alexandria, in sandy places; Ramle. — **Matruqa.** — **M. p.** Sheikh Zoeyd. —

Widely distributed throughout the Mediterranean region.

45. (28.) **Trisetum** Pers.

Spikelets usually rather small, 2—9 mm long, in usually close, often spike-like panicles; rachilla ciliate or long hairy, very rarely glabrous; disarticulating above the empty glumes and between the flowering glumes produced into a short bristle beyond the uppermost flower. Flowers 2—6, bisexual, or the uppermost more or less reduced. Glumes 2, persistent, equal or more or less unequal, acute, keeled, lower 1- (or like the upper more or less distinctly 3-) nerved, hyaline. Flowering glumes equalling or exceeding the empty ones, membranous with hyaline tips and broad margins, acutely 2-toothed, sometimes with fine short bristles from the teeth, faintly or obscurely 5—3-nerved, awned; awn from the back near the tip, fine straight or geniculate and twisted below; callus minute, more or less hairy or glabrous. Palea shorter than the glumes, 2-keeled, 2-toothed, hyaline. Stamens 3. Ovary glabrous; styles distinct, very short; stigmas laterally exerted, plumose. Grain oblong, whitish, embraced by the usually slightly hardened back of the glume; hilum basal, short; embryo small. — Egyptian species annual; blades flat, usually flaccid; ligules hyaline; panicle usually contracted, often spike-like, rarely open and lax, more or less glistening.

Species 50—60, mainly in the temperate region of the northern hemisphere, and along the Andes to Patagonia; a few in Australia and New Zealand.

A. Panicle ovate-oblong to oblong 1—3 cm long

I. Leaves pubescent; spikelets 4 flowered,
glumes shorter than the flowers 1. **T. pumilum.**

II. Leaves glabrescent, sheaths glabrous . . . 2. **T. macrochaetum.**

III. Leaves hirtulous, sheaths densely pubescent 3. **T. glumaceum.**

B. Panicle linear, 5—15 cm long 4. **T. lineare.**

103. (1.) **Trisetum pumilum** (Desf.) Kunth Enum. Plant. I (1833), p. 297. — Boiss. Fl. Or. V, p. 534. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 170 no. 1184. — Sickenberg. Contrib. Fl. d'Eg., p. 308. — *Avena pumila* Desf. Fl. Atl. I (1798), p. 103. — Annual; culms fascicled, slender, geniculate, ascending or suberect, 4—18 cm long, glabrous or hairy below the lower nodes, smooth, 3—4-noded, simple or branched below, upper internodes exerted; leaves more or less finely and softly hairy; sheaths thin, usually rather loose; ligules very obtuse, dentate, ciliolate, often hairy from the back, up to 1 mm long; blades linear, tapering to a subacute or acute, subcallous point, 1—4 cm long, 2.5 mm broad, flat, flaccid; panicle spike-like, oblong, 1—4 mm long, very dense, sometimes lobed; rachis very slender, puberulous or glabrous below; branches solitary, erect, the longest up to 12 (rarely to 25) mm long, closely branched from the base, finely filiform, puberulous to almost villous; lateral pedicels very short; spikelets very crowded, 3—7 mm long, pallid; flowers 2—4; rachilla hairy, hairs much exceeding the joints; glumes equal or subequal, ovate-lanceolate, finely subacuminate, 3-nerved, pubescent; flowering glumes oblong in profile, acute, very minutely 2-toothed, 2—5 mm long, hyaline except at the subherbaceous back, 5-nerved; awn very fine, straight, subterminal or from $\frac{1}{4}$ way below the readily splitting tip; pales about $\frac{1}{2}$ the length of the glumes; anthers ellipsoid, scarcely 0.5 mm long; grain about 0.75 mm long. — Flow. April to May.

M. ma. Alexandria: Montaza. — **D. l.** Abu Roash and near the Giza Pyramids; Pyramids of Zâwiyet el-'Aryân; Abusir, near Cairo, in sandy places; Marragh, N. from Siut. — **D. i.** Es-Sâlihiya, in sandy places; Ismailia, in deep sand; bords of the lake Timsâh; Bîr Menâyif, in sandy places. — **D. a. sept.** Belbeys; Helwan, in gardens, a common weed; Mouth of the Wady Rished, in sandy places; Wady Hof, sandy places.

Also known from Spain and Arabia.

104. (2.) **Trisetum macrochaetum** Boiss. Diagn. Ser. I fasc. 13 (1853), p. 58. — Annual, culms fascicled, slender geniculate, ascending or suberect, 5—10 cm long, glabrous or hairy below the lower nodes, smooth 3—5-noded, simple or branched below, upper internodes exerted. Leaves glabrescent, linear-setaceous, the lower convolute; sheaths thin, usually rather loose, ligules very obtuse, dentate, ciliolate, often hairy from the back; panicle 2.5 to 3 cm long, rather loose, contracted; spikelets 2-flowered, with a hairy, sterile rudiment; glumes scabrous at the keel, acuminate, longer than the flowers, the lower linear, one-third as broad and two-third as long as the upper; the upper glume 4 mm long; flowering glume half as long

as the empty glumes, the tip ending in two bristles, half as long as the pales, the awn bent, twisted below, trice as long as the glumes; anthers ellipsoid, scarcely 0,5 mm long; grain about 1 mm long. — Flow. May.

M. ma. Mariut; Bir-el-Hammâm; Mariut-Abd-el qader, common. Also known from Cyrenaica and Palestine.

105. (3.) **Trisetum glumaceum** Boiss. Fl. Or. V (1884), p. 534. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 170 no. 1185. — Sickenberg. Contrib. Fl. d'Eg., p. 308. — Annual, culms fascicled, slender geniculate, ascending or suberect, 10—14 cm long, glabrous or hairy, the lower nodes smooth, 3—4-noded, simple or branched below, upper internodes exserted. Leaves hirtulous, sheaths retrorsely hairy, lamina linear, flat. Panicle oblong, spike-like, 2—3 cm long, dense; spikelets 2-flowered, with a rudiment of a third flower; glumes longer than the flowers, nearly equal, lanceolate, acute, 4 mm long, glabrous, glossy, somewhat, scabrous at the keel, axis at the base of the upper flower and sterile stalk long-hairy; flowering glume half as long as the empty glumes, ending in two bristles half as long as itself, and a bent awn short-exserted from glumes; anthers ellipsoid, scarcely 0,75 mm long; grain about 1 mm long.

M. ma. Bir-el-Hammâm; Mariut and Mex near Alexandria; Mandara; Abukîr in sandy places. — **M. p.** Kafr Soliman; Damietta in sandy places; Kafr Lizwâni in sandy places, not rare. From Qatiye eastward.

Also known from Sinai and Syria.

106. (4.) **Trisetum lineare** (Forsk.) Boiss. Diagn. Plant. Or. Ser. I. XIII (1853), p. 49. — Flor. Or. V, p. 534. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 170 no. 1186. — *Trisetaria linearis* Forsk. Flor. aeg.-arab., p. LX and 67. — Delile Fl. d'Eg., p. 29 tab. 12 fig. 3. — Annual, culms fascicled, slender geniculate, ascending or usually erect, 25 to 45 cm high, glabrous or appressed-hirtellous, thickish, rigid, 3—5-noded, simple or branched below, upper internodes exserted. Leaves hirtulous vel glabrous, sheaths long, nerved. Panicle cylindrical, spike-like, 5 to 15 cm or more long; spikelets short pedicelled, 2-flowered with the upper flower stipitate, or 1-flowered, with the upper flower reduced to an awn; glumes nearly equal, longer than the flowers, linear-lanceolate, 4 to 5 mm long, acuminate 3-nerved below; flowering glume tapering into two bristles as long as itself, sometimes with a third shorter one, the bent awn twisted at the base, twice to three times as long as the bristles; pale narrower, bifid; anthers ellipsoid, scarcely 0,5 mm long; grain about 0,75 mm long. — Flow. April.

M. ma. Mariut near Alexandria, in sandy places common; Mex; Ramle, and Mandara, Montaza in sandy places — **M. p.** Damietta; Rosetta, in sandy places; Brullus. — Port Said in deep sand. From Bir Abu-²Efeyn to El-Arish at desert places. —

Also known from Syria.

46. (29.) *Avena* Linn.

Spikelets large or very large, 14 to 40 mm long, pendulous in open, usually very loose panicles; rachilla hairy or glabrous, disarticulating above the empty glumes and between the flowering glumes, or only above the glumes, or not at all in cultivated forms, usually terminated by a rudimentary flower. Flowers 3—5, the lower 1 or 2 (rarely 3) bisexual, the upper reduced, smaller, male or barren or quite rudimentary. Glumes 2, persistent, scarious, equal or subequal, acute or acuminate, rounded on the back, 7—11-nerved. Flowering glumes distinctly shorter or just equalling the glumes, subherbaceous, with rather rigid scarious tips, acute or acuminate, bifid, with or without bristles from the lobes, 5—9-nerved, lower 1—3-awned; awn dorsal from the middle or slightly above it, geniculate and twisted below or (in the upper glumes) imperfect; callus short, villous (or imperfect and glabrous in cultivated forms). Palea shorter than the glumes, 2-keeled, 2-toothed or bifid. Lodicles 2, rather large, hyaline, entire. Stamens 3. Ovary densely villous from the base; styles distinct, extremely short or 0; stigmas laterally exerted, plumose. Grain oblong, subterete, grooved in front, hairy, pallid, somewhat soft or at least easy to cut, tightly embraced by the hardened glume and the palea; hilum fine, linear, long; embryo small. — Annual; blades linear, flat, flaccid; ligules hyaline or scarious; panicle usually very loose, often secund, with large pendulous spikelets.

Species about 7, indigenous in the Mediterranean region, some of them widely spread as weeds, 1 known only in numerous cultivated forms¹).

- A. Spikelets 30 to 40 mm long; rachilla tough and glabrous between the glumes 1. *A. sterilis*.
- B. Spikelets 18 to 25 mm long; rachilla villous and disarticulating between the glumes:
 - I. Glumes shortly bifid 2. *A. fatua*.
 - II. Glumes lobes produced at the tips into long bristles
 - a) Glumes 9-nerved; flowering glume hairy from the base to the middle 3. *A. barbata*.
 - b) Glumes 7-nerved; flowering glume hairy almost to the tip 4. *A. Wiestii*.

¹) *Avena orientalis* Schreb. is said (Sickenberg. Contrib. Fl. d'Eg., p. 308.) to occur at Tanta, but, no doubt, has been introduced there.

107. (1.) **Avena sterilis** L. Spec. Plant. ed. II (1762), p. 118. — Boiss. Fl. Or. V, p. 542. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 170 no. 1187. — Sickenberg. Contrib. Fl. d'Eg., p. 308. — Culms usually fascicled with few or no barren shoots; sheaths glabrous, rarely the lower hairy; ligules obtuse, 2 to 5 mm long; blades linear to lanceolate-linear, up to 30 cm long by 6 to 10 mm broad, rarely scantily hairy, scabrid; panicle loose; branches spreading equally all round or secund; spikelets 30 to 50 mm long, with 2 awned flowers at the base and 1—2, rarely 3 smaller awnless flowers above them; rhachilla freely disarticulating above the glumes, though and glabrous between the flowering glumes; glumes broad-lanceolate, acuminate, 9—11-nerved; flowering glumes lanceolate, long acute, finely 2-toothed, lowest 3 to 4 cm long, usually pallid below and greenish towards the tips, scabrid to hispidulous upwards, with long white or whitish hairs up to the middle, 7-nerved, only the 2 lowest awned; awn from the middle, scabrid to almost villous below, column more or less brown, often pallid, stout, 10 to 25 mm long, bristle. 2 to 5 cm long; anthers almost 5 mm long; grain tightly embraced, free, silky all over. — Flow. April to May.

M. ma. Matruqa; Montaza; calcarious rocks at Mariut near Alexandria, common; Abukir, on calcarious rocks. — **N. d.** Ismailia, on the sides of the fresh-water canal; Benha in fields; Rosetta in fields; Merg; Cairo. — **N. f.** In fields at Tomia, Fayûm, common; Medinet-el-Fayûm, everywhere in fields as a weed. — **O.** Dakhel, in fields; Great Oasis, Kharge; Mansuf in fields; 'Ain Tauil; 'Ain-el Ehsauya.

Local name: khâfûr (Schweinfurth).

A weed of Mediterranean origin.

108. (2.) **Avena fatua** L. Spec. Plant. I (1753), p. 80. — Boiss. Fl. Or. V, p. 543. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 170 no. 1190. — Culms solitary or few in a tuft, with few or no barren shoots; leaf-sheaths glabrous or the lower more or less hairy; ligules short, very obtuse, up to 3 mm long; blades linear to lanceolate-linear, up to 30 cm by 12 mm, glabrous or rarely sparsely hairy, scabrid; panicle open or contracted; branches spreading equally all round or more or less erect and subsecund; spikelets 8 to 20 mm long, with 2—3-awned flowers and with or without a rudimentary, usually minute, awnless flower above them; rhachilla freely disarticulating below and more or less so between the glumes, joints between the glumes villous; empty glumes broad-lanceolate, acuminate, 7—9-nerved; flowering glumes lanceolate, acute, shortly 2—4-toothed, the lowest 12 to 18 mm long, usually brown below and green towards the tips, scaberulous, with stiff brown hairs to the middle

or subglabrous with the exception of the very short callus, 7-nerved, all awned except the rudimentary uppermost; awn from the middle, scabrid, column very dark, 8 to 15 mm long, bristle 1 to 3 mm long; anthers 2 to 4 mm long; ovary villous all over; grain 3—4 cm long, tightly embraced, free, silky all over. — Flow. March to April.

M. ma. Mariut-Mergheb near Alexandria, in fields. — **N. d.** Benha; Qalyûb, At Merg, in fields very common; Mehallet el Kebîr; Island Roda near Cairo; environs of Cairo everywhere as a weed in all fields; Giza, common in fields. — **N. f.** Medinet el Fayûm; Senhûr; Abuxa, common in all fields; Kafr Mukfut; Tomia. — **N. v.** Beni Suêf in fields not rare; Feshn, weed in fields; Minia; Siut, in all fields a common weed. — **O.** Little Oasis; Farâfra, common in fields; Dakhel; Great Oasis, 'Ain Dakhakhin, common.

Local name: Khâfur; Zommeyr (Forsk.-Aschers.) ghallash sheytâny (Ascherson) sabûs ssabbarâs (Schweinfurth, Muschler) basheruk (Ascherson) bakhragan; shaîr-el-ghul (Ascherson).

A widely-spread weed of Mediterranean origin.

109. (3.) **Avena barbata** Brot. Fl. Lusit. I (1804), p. 108. — Boiss. Fl. Or. V, p. 543. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 170 no. 1188.

— Siekenberg. Contrib. Fl. d'Eg., p. 308. — Stems erect, usually 2—3 from a dense tuft of barren shoots, glabrous; leaf-sheaths villous to glabrescent; ligules broad-ovate, up to 5 mm long; blades linear, up to 18 cm by 6 mm, but usually shorter and much narrower, villous to glabrescent, scabrid; panicle or racemes up to 18 cm long, nodding, usually secund; branches scantily branched or simple, finely filiform, flexuous; spikelets 18 to 30 cm long, 2—3-flowered, 2—3-awned, 9-nerved; rachilla freely disarticulating below and between the flowers, joints between the glumes villous; empty glumes lanceolate, acuminate; flowering glumes narrowly lanceolate, acuminate, bifid; lobes produced into fine bristles, the lowest 12—18 mm long (excluding the bristles), pallid to brown below the long whitish scarious tips, densely covered with fine stiff whitish or yellowish hairs to the middle, scaberulous, 7-nerved, all awned except the uppermost; awn from the middle, scabrid, column dark; anthers 2—3 mm long; ovary villous all over; grain tightly embraced, free, slender, oblong, 6 to 8 mm silky. — Flow. March to May.

M. p. Bir-el-Abd; El-^cArish at desert places. — **N. d.** Cairo.

Local name: Khâfur.

A widely dispersed weed of Mediterranean origin.

110. (4.) **Avena Wiestii** Steud. Syn. Plant. Glum. I (1855), p. 230. — Boiss. Fl. Or. V, p. 543. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 170

no. 1189. — Sickenberg. Contrib. Fl. d'Eg., p. 308. — Stems erect, usually 2—3 from a dense tuft of barren shoots, glabrous, 50 to 80 cm high, sparingly hairy; leaf-sheaths villous to glabrescent; ligules broad-ovate, up to 5 mm long; blades linear, up to 18 cm long, 6 mm broad, but usually shorter and much narrower, villous to glabrescent, scabrid; panicle one-sided, spikelets 2-flowered, small, 18 to 20 mm long; rhachilla freely disarticulating below and between the flowers, joints between the glumes villous; empty glumes lanceolate, acuminate, equal, flowering glume, 1.2 cm long, hairy almost to the tip, with an ovate-oblong callosity and scar at the base, bifid, teeth setaceous-aristate; awn twice as long as the glumes; anthers 2—3 mm long; ovary villous all over; grain tightly embraced, free, slender, oblong, 6 to 8 mm long, silky. — Flow. March to April. —

M. ma. Matruqa; Mariut; Ramle, Mex near Alexandria; Abdel Qadr, in fields common; Abukîr. — **M. p.** El-Arish. — **N. d.** Rosetta; Damietta; Tanta; Qalyub. Cairo, everywhere in fields and on sandy places; Ismailia in fields near the fresh-water canal. — **N. v.** Esne, in fields not rare; Aswân in fields a common weed everywhere. — **D. i.** Near Es-Sâlihiya, in sandy often stony places; Ramses; Ismailia, in deep sand; Atabet-el-Gisir. — **D. l.** Abu Roash. — **D. a. sept.** Cairo, Mokkatam; Wady Khafura (which has received its name from the plant!) Wady Abu Sateri, 1000 m. s. m. — Wady Dugla; Wady Rished near Helwan.

Local name: Khâfur; Zommeyr (Forskâl, Del. Ehrenberg.)

Perhaps the species is only a variety of *Avena barbata* Brot. It is a widely distributed weed of Mediterranean origin.

47. (30.) **Danthonia** DC.

Spikelets small to large, laterally compressed, pedicelled, panicked, very rarely sessile or subsessile in distichous spikes; rhachilla disarticulating above the glumes and between the flowers, usually ending with a rudimentary flower. Flowers 3 to many, bisexual, the uppermost reduced, exceeded by the glumes or more or less equalling them. Empty glumes equal or subequal, more or less lanceolate in profile, usually acute or acuminate, keeled, hyaline to scarious or subherbaceous, 3—9- (rarely 1-) nerved, often with transverse veins. Flowering glumes firmly membranous to chartaceous, hairy, often with the hairs partly gathered in variously arranged tufts, very rarely almost glabrous. 7—11- (rarely 5-) nerved, 2-lobed, awned from the sinus or sometimes the lobes reduced to minute teeth and the awn to a mucro; lobes free, rarely more or less adnate to the awn, acute or

obtuse, with or without a bristle from the tip; callus small or rather long and acute, hairy. Pales 2-keeled, usually entire or almost so, mostly exceeding the insertion of the awn of the flowering glume. Lodicules 2, usually large or ciliate, many-nerved, or sometimes small, fleshy, glabrous. Stamens 3. Ovary oblong or obovoid, glabrous; styles distinct, slender, long or short and then sometimes with the stigmatic hairs decurrent on the inner side and jointing over the top of the ovary; stigmas plumose, laterally exserted. Grain oblong, obovoid or ellipsoid usually semiterete, rarely almost terete; hilum obscure, oblong, short; embryo $\frac{1}{3}$ to $\frac{1}{5}$ the length of the grain. Perennial, rarely annual; leaves very variable; panicle with usually solitary, alternately and closely divided branches, often very dense, sometimes compactly capitate, rarely transformed into a distichous spike.

Species 65—70, mostly in the temperate regions of the Southern Hemisphere, particularly in South Africa, Australia and New Zealand.

111. **Danthonia Forskålei** (Vahl) Trin. Gram. Icon. et Descript. I (1828) tab. 49. — Boiss. Fl. Or. V, p. 551. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 170 no. 1191. — Avena Forskålei Vahl Symb. bot. II (1791), p. 25. — Del. Fl. Aeg. Illustr., p. 28 tab. 12 fig. 1. — Avena pensylvanica Forsk. non. L. Fl. aeg.-arab., p. 23. — A. arnudinacea Del. Fl. Aeg. Illustr., p. 27 tab. 12 fig. 1. — Perennial, 40 cm high, velvety; root-stock tufted, indurated, with long fibres; culms procumbent at the base, often branched, then ascending. Leaves broad-linear, acuminate, 1 to 6 cm long, 2—3 mm broad, rigid, crowded near the base; upper sheath dilated, forming a spathe to the panicle. Panicle 7 to 10 cm long, 1 to 1.5 cm broad; spikelets 3-flowered; grain oblong, 0.75—1 mm long. — Flow. April to March.

M. ma. Everywhere in the environs of Alexandria in sandy places; Abukir. — **M. p.** Rosetta; Edku, common in fields. — Damietta in sandy places; Port Said, not rare. — El Grady, Rus es Subiyân; el-Arish. — **D. l.** Abu Roash, near Cairo on calcareous ground; near the Pyramids of Giza and Saqqâra; Abusir in sandy places. — **D. i.** Eş-Sâlihiya, in sandy places, rare on calcareous rocks; Ismailia, in sandy places common. — **D. a. sept.** Gebel Iswid. common; Bir el Fakhme; Wady Abu Shusha, Wady Gerawi, Wady Rished, Wady Hof near Helwan. — **D. a. mer.** Khôr Abu Sebêra; Gebel Silsile; Er-Rahâma, on calcareous ground.

Local name: mu'asal (Ascherson) rind (Schweinfurth, Muschler), shegeret-el-gemel (Forsk. Ehrenberg).

Also known from Arabia.

48. (31.) *Cynodon* Pers.

Spikelets 1-flowered, small, laterally compressed, sessile, imbricate, alternately 2-seriate and unilateral on a slender keeled rachis; rachilla disarticulating above the glumes, produced, or not, beyond the flower. Flower bisexual. Empty glumes narrow, keeled, acute or subulate-mucronate, the upper usually deciduous with the flower, the lower subsistent. Flowering glume exceeding the empty glumes, navicular, firmly membranous, 3-nerved, awnless, keel ciliate. Pale somewhat shorter than the flowering glume, 2-keeled. Lodicules 2, minute, obovate-cuneate, glabrous. Stamens 3. Ovary glabrous; styles distinct, slightly shorter than the plumose styles. Grain oblong, subterete; embryo about $\frac{1}{3}$ the length of the grain; hilum linear, $\frac{2}{3}$ the length of the grain. — Perennial; stems creeping, rooting at the nodes and emitting from them fascicles of barren shoots and flowering culms; spikes 2—6 in terminal umbels.

Species 2; 1 in extra-tropical South Africa, the other almost cosmopolitan.

112. *Cynodon dactylon* (L.) Pers. Syn. Plant. I (1805), p. 85. — *Dactylus officinalis* Vill. Hist. Plant. Dauph. II. p. 69. — Boiss. Fl. Or. V, p. 553. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 170 no. 1193. — *Panicum dactylon* L. Spec. Plant. I, p. 58. — Perennial; culms from 10 to 30 cm long, slender, glabrous, smooth, many-noded, the lower internodes very short, enclosed, the upper 3—4 much longer, more or less exserted; leaves usually conspicuously distichous in the barren shoots and at the base of the culms; sheaths tight, glabrous or hairy, often bearded at the mouth; ligule a very fine ciliate rim; blades linear, finely acute to pungent, 1 to 12 cm long, 2—4 mm broad, very rigid to flaccid, folded or convolute or flat, more or less glaucous, glabrous or hairy, smooth below, scaberulous above; spikes 2—6, straight, 1—5 cm long; rachis pubescent at the base, keel and margins scabrid or the keel smooth; spikelets light green or purplish, 0.75—3 mm long; rachilla produced, very slender, equalling $\frac{1}{2}$ the length of the spikelet; empty glumes lanceolate, acute to subulate-mucronate, the lower 0.5—1 mm long, the upper usually slightly longer, keels scabrid or smooth; flowering glumes obliquely oblong to semi-ovate, subobtusate or minutely apiculate, about 2.5 mm long, keel ciliate; keels of pale scaberulous; anthers oblong, 0.75 mm long; grain 0.75 mm long. — Flow. all the year round. —

M. ma. El-Mex, in sandy places; Alexandria, a common weed in fields and gardens; Ramle in sandy places. — **M. p.** Rosetta in sandy places; Kafr Lizwâui, in sandy places common; El-Arish. — **N. d.** Damietta, a common weed in fields. — Damanhur; Tanta;

Zifta; Qalyub; Belbês; environs of Cairo; everywhere a common weed. — **N. f.** Medînet el Fayûm; Senûris, as a weed in gardens and fields; Tomia everywhere in fields. — **N. v.** Alexandria Cairo, everywhere; Beni Suêf, in fields and gardens; Siut, everywhere a common weed; Aswân, common; Minia; Girge; Akhmîm; Esne. — **O.** Siwa; Little Oasis; Dakhel; Great Oasis, Qasr 'Ain ez-Zayan: El-Kharge; 'Ain Taul; Bêris, common in fields. — **D. l.** Bir Kerawi, two days journey East from Farâfra. — Abu Roash, in calcareous places (!); near the Pyramids of Gîza in sandy places; Saqqâra; Maragh, in the North of Siut. — **D. i.** Ismailia, common in sandy places; Tell-el-Kebîr; Eş-Sâlihîya, common in sandy places. — **D. a. sept.** Gebel ahmar, near Cairo; Wady Hof, Wady Rished near Helwan, rare; Wady Abu Shusha, common; Suez. — **D. a. mer.** Gebel Abu Ghabab; Gebel Silsila, not rare; Aswân, in sandy places; Qoseyr. —

Local name: Negil; nishîl (Forsk.)

A cosmopolitan grass.

49. (32.) **Schoenefeldia** Kunth.

Spikelets 1—4-flowered, sessile, crowded, unilateral, 2-seriate on a slender rhachis. Empty glumes 2, subequal, persistent, keeled, acute-subulate, exceeding the flowers; flowering glume and pale membranous, flowering glume at the tip long aristate, pale almost equalling the flowering glume, canaliculate, hairy; lodicules 2, minute, delicate, glabrous; stamens 3; ovary glabrous, styles 2, distinct, short; stigmas laterally exerted, plumose; grain oblong; embryo rather large; hilum punctiform basal. — Annual herbs, leaves flat or folded; spikes solitary or several to many in terminal umbels or short racemes, erect or stellately spreading. —

A small genus of only 3 species in the Mediterranean region from Egypt to East-India.

113. **Schoenefeldia gracilis** Kunth Rev. Gram. I (1828), p. 283 tab. 53. — Boiss. Fl. Or. V, p. 553. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 170 no. 1192. — Annual, very slender; culms 10—20 cm long, simple or branched, almost filiform; leaves 12 to 30 cm long, very narrow, flaccid, tips capillary; ligule a few hairs. Spike 6 to 10 cm long, golden-yellow, erect; rhachis flattened, serrulate. Spikelets 2 mm long, subsessile, glumes ovate-lanceolate subaristately acuminate, 1-nerved, keels ciliate; awn up to 2.5 cm long, capillary, curved; pale narrow, keels ciliate, the tip 2-toothed. Grain very slender, acute, pericarp loose. — Flow. October.

N. v. Tingur near Aswân (Ehrenberg, but not yet collected again).

Also known from Nubia, Abyssina, Senegal British India and Punjab. —

50. (33.) **Chloris** Swartz.

Spikelets 2—4 flowered, sessile, crowded, unilateral, 2-seriate on a slender rhachis; rhachilla disarticulating above the glumes, tough between the flower, more or less produced; lowest flower bisexual, the second male or barren, the following, if present, barren, often minute. Empty glumes 2, persistent, narrow, keeled, acute and mucronate, very thin, or broad, and the upper obtuse, more or less bilobed and rounded on the back. Bisexual flower: flowering glume narrow or broad, 3-nerved, acute or obtuse minutely 2-toothed, usually awned from below the tip, often ciliate; pale almost equalling the glume, 2-keeled; lodicules 2, minute, delicate, glabrous; stamens 3; ovary glabrous, styles distinct, short; stigmas laterally exserted. Male flower: flowering glume and pale as in the bisexual flower, but smaller and glabrous. Rudimentary flowers glabrous, awned or awnless, small to very small, usually without a trace of a pale. Grain oblong, triquetrous; embryo rather large; hilum punctiform, basal. — Perennial or annual; leaves flat or folded; spikes solitary or several to many in terminal umbels or short racemes, erect or stellately spreading.

Species 40—45, in the tropical and subtropical regions of both hemispheres.

114. **Chloris virgata** Swartz. Flor. Ind. Occ. I (1797). p. 203. — C. meccana Hochst. et Steud. Syn. Plant. glum. I. p. 205. — Boiss. Fl. Or. V, p. 554. — *Chloris barbata* L. var. *meccana* Aschers. et Schweinf. Ill. Fl. d'Eg., p. 170 no 1194. — Sickenberg. Contrib. Fl. d'Eg., p. 308. — Perennial or annual (flowering the first year?). 30 to 90 cm high; culms erect or geniculately-ascending or prostrate below, rooting and emitting fascicles of barren shoots from the nodes, 3—5-noded, more or less compressed below, glabrous, smooth, internodes exserted; sheaths glabrous, rarely sparingly hairy, smooth, the lower much compressed, keeled; ligules membranous, very short, very minutely ciliate; blades linear, gradually tapering to an acute point, 2—8 cm long, 2—3 cm broad, flat or folded, sometimes flaccid, glaucous, glabrous, rarely sparingly hairy, smooth below, scaberulous above, margins rough; spikes 6—15 or more, suberect, sessile, whitish-green or purplish, 2—6 cm long, straight; rhachis pubescent or villous at the base, scabrid; spikelets 2- (rarely sub-3-) flowered, 2-awned, almost 5 mm long; rhachilla-joint between the flower rather long, terminal joint very minute; empty glumes narrow, lanceolate, hyaline, mucronate, keels scabrid, the lower 2—3.5 mm long, the upper almost 5 mm; flowering glume obliquely oblong, acute or obscurely 2-toothed, 2.5—3 mm long, whitish or almost black when mature, ciliate along

the marginal nerves and bearded below the tip, finely grooved on the faces, keel glabrous or minutely ciliate below the middle; awn 10—20 mm long, straight; pale glabrous; anthers 0,5—0,75 mm long; grain linear-oblong, obtusely triquetrous 0,75 mm long; upper glume (or glumes) quite empty, obliquely cuneate in profile, 2,5 mm or less long, awn from below the tip, 6 to 9 mm long. — Flow. March.

N. v. Dendera; Island Mashab, near Aswân; Elephantine; Island Ssallug and Tingur near Aswân; Luksor, in sandy places not rare. Qurna. — **O.** Great Oasis, Mex.

Also known from Arabia and South Africa.

51. (34.) *Tetrapogon* Desf.

Spikelets on the outer face of a flattened rhachis, 2-ranked, 3—4-flowered, the lower two flowers perfect, the others tabescent, consisting of one pale. Empty glumes 2, persistent, membranous, keeled, the lower acuminate, the upper rounded at the tip, aristate-mucronate. Flowering glume keeled, 3-nerved, obtuse or retuse long-awned just below the tip; pale retuse, 2-keeled. — Perennial herbs; spikelets in 2, erect spikes, adnate by their face, appearing to form one, 4-ranked spikes.

A small genus of only 3 or 4 species.

115. *Tetrapogon villosus* Desf. Fl. Atlant. II (1800), p. 389 tab. 255. — Boiss. Fl. Or. V, p. 555. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 170 no. 1195. — Sickenberg. Contrib. Fl. d'Eg., p. 308. — Perennial, 20 to 30 cm high; tufted; rootstock thickish, with a dense rosette of leaves; culms erect sparingly leafy. Leaves glabrous, linear, channeled, the radical leaves somewhat 2-ranked, crowded. Spikes 4 to 6 cm long, 1,5 cm thick (included the crowded awns); flowering glume obovate, obtuse, concave, silky-hairy at the back, obtuse or retuse at the tip, with an awn twice to four times as long. — Flow. April to May.

D. i. Gebel Nebi Geharn near El-Arish. — **D. a. sept.** Wady Rigbe; Wady Azkhar in the northern Galala.

Also known from western North-Africa, Turkish Marmarica, Arabia and Eritrea.

52. (35.) *Dinebra* Jacq.

Spikelets 2—3-flowered, small, crowded, biseriate on one side of slender spreading or deflexed spikes that are collected in narrow pyramidal racemes, not jointed at the base: rhachilla slender, jointed at the base, produced beyond the flowering glumes, and bearing

on imperfect glume. Glumes 4—5, the first and second empty, persistent much longer than the third and fourth, lanceolate, awned, 1-nerved-keeled; the second glume $\frac{1}{4}$ longer than the first; the third and fourth very small, broadly ovate, subacute, hyaline, 1-nerved; pale hyaline. Lodicules 2, small. Anthers 3, very small. Styles free. Grain ovoid, trigonous, wrinkled free. — Annual, leafy grasses. Leaves flat. —

A small genus of about 10 species in the Mediterranean region and tropical Africa.

116. **Dinebra retroflexa** (Vahl) Panzer in Denkschrft. Acad. Münch. (1814), p. 270 tab. 12. — Boiss. Fl. Or. V, p. 557. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 171 no. 1197. — Sickenberg. Contrib. Fl. d'Eg., p. 309. — *Cynosurus retroflexus* Vahl Symb. II, p. 20. — *Dinaeba aegyptiaca* Del. Fl. d'Eg., p. 26 tab. 11 fig. 3. — *D. arabica* Jacq. Fragm. bot., p. 77 tab. 121. — Annual. Culms 15 to 60 cm high, tufted, branching from the base, erect or geniculately ascending, leafy throughout. Leaves flat, 6 to 15 cm long, flaccid, finely acuminate, sparsely hairy; ligule very short. Racemes 8 to 25 cm long, erect; rhachis strict, stout, smooth. Spikes 2 to 5 cm long, opposite, alternate or whorled, sessile, green or pale yellow, shining, at first erect, at last deflexed. Spikelets loosely imbricated, about 6.5 cm long; the first and second glume with straight terminal awns. — Flow. April.

N. d. Damietta, in gardens as a weed; Menzale, not rare. Zaqaq; Shubra, near Cairo.

Local name: Baksheyft (Schweinf.)

Also known from Arabia and British India.

53. (36.) **Eleusine** Gaertn.

Spikelets 3—6-flowered, laterally compressed, densely imbricate, alternately biseriate, unilateral, sessile on a flattened rhachis, the uppermost terminal, perfect; rhachilla disarticulating above the empty glumes and between the flowering glumes, or tough, produced, sometimes terminating with a rudimentary glume. Flowers bisexual. Empty glumes 2, subequal, persistent, obtuse or obscurely mucronate, membranous, strongly keeled, 3—5-nerved, the lateral nerves close to the keel, the lower shorter, with the keel crested. Flowering glumes very similar, 3-nerved near the base; lateral nerves submarginal above, with 1—2 short additional nerves close to the keel. Pales slightly shorter than the glumes, 2-keeled, keels winged. Lodicules 2, minute, cuneate. Stamens 3. Ovary glabrous; styles slender from a broadened base, distinct; stigmas plumose, laterally

exserted. Grain broadly-oblong to globose, broadly grooved; pericarp loose, delicate, breaking up irregularly or almost circumscissile; seed finely striate; embryo suborbicular, basal; hilum punctiform, basal. — Annual or perennial; leaves long, flat or folded, flaccid or firm; spikes in interrupted spikes or the upper or all in a terminal umbel, straight, suberect, spreading or deflexed; spikelets glabrous.

Species 6 in tropical Africa and Asia; 1 widely spread through the tropics.

- A. Spikes slender, straight; rhachilla disarticulating
at least above the glumes; flowering glumes
lanceolate, oblong in profile, acute 1. *E. indica*.
- B. Spikes thick, often curved; rhachilla tough; flower-
ing glumes obliquely ovate in profile, obtuse 2. *E. coracana*.

117. (1.) **Eleusine indica** (L.) Gaertn. De fruct. et sem. I (1797), p. 8. — Boiss. Fl. Or. V, p. 555. — *Cynosurus indicus* L. Spec. Plant. I, p. 72. — Annual. Culms erect or geniculate-erect, from 10 cm to 60 long, slender or stout, compressed, 2—3-noded, glabrous, smooth, upper internodes exserted; leaves often numerous, crowded near the base and conspicuously distichous; sheaths compressed, pallid, glabrous except at the often ciliate margins, striate; ligules thin, membranous, short, long-fimbriate; blades linear, long tapering to an acute point, 15 to more than 30 cm long and 2.5 to 6 mm broad, flat or folded, sometimes flaccid, glabrous, rarely sparingly hairy below, smooth; spikes rather slender, straight, 2 to 10 cm long, sessile, 2—14 in a terminal umbel, usually with 1—2 rarely to 7 additional spikes, 0.5 to 6 cm below it; rhachis pubescent to villous at the base, otherwise glabrous, smooth; spikelets 2 to 4 mm long, 3—6-flowered, disarticulating above the glumes and very tardily or tough between the flowering glumes; empty glumes and flowering glumes ovate, lanceolate-oblong in profile, acute, the latter about 4 mm long; anthers 1 mm long; grain oblong; seed heart-shaped in cross section, 1 mm long, dark reddish-brown, obliquely striate; embryo small. — Flow. April. —

N. d. Damanhur, as a weed in fields and gardens.

Tropics of the Old World; introduced (?) in the New World; naturalized in the Mediterranean region. —

118. (2.) **Eleusine coracana** (L.) Gaertn. De fruct. et sem. I (1797), p. 8 tab. I fig. 11. — Sickenberg. Contrib. Fl. d'Eg., p. 309. — Very like *Eleusine indica*, but more robust, up to 1.50 m high; spikelets more crowded, to as thick as a finger, often curved; rhachilla tough; empty glumes and flowering glumes broader. ovate in profil, obtuse;

grain globose, 1 to 1.5 mm in diam.; usually dark reddish-brown, finely striate, striae curved. — Flow. March to April. —

M. ma. In the west of Alexandria at Khreir, subspontaneous.

Local name: Bishna.

Grown in many parts of tropical Africa, tropical Arabia, and throughout India; originated very probably from *Eleusine indica*. The figure in Gaertner (l. c.) represents the seed as smooth and not striate; there is a little doubt that it refers to a variety which is grown in India and in Southern Arabia, distinguished by smooth, whitish seeds.

54. (37.) **Dactyloctenium** Willd.

Spikelets 3—5-flowered, laterally compressed, densely imbricate, biseriate, sessile, unilateral on a flattened rhachis, the uppermost reduced; rhachilla tardily disarticulating above the empty glumes, tough between the flowering glumes. Flowers bisexual, the uppermost rudimentary. Empty glumes 2, unequal, strongly keeled, the lower ovate, acute, thin, persistent, the upper elliptic-oblong in profile, obtuse, mucronate or awned, firm, deciduous. Flowering glumes ovate, subacuminate, 3-nerved, mucronate or awned, deciduous with the grains. Pales about as long as the flowering glumes, 2-keeled, subpersistent. Lodicules 2, cuneate, minute. Stamens 3. Ovary glabrous; styles distinct, very long, subterminally exserted. Grain subglobose, slightly laterally compressed, not grooved or hollowed, rugose or punctate; pericarp very delicate, irregularly breaking away; embryo scarcely equalling $\frac{1}{2}$ the length of the grain; hilum basal, punctiform. — Annual or perennial; leaves flat, subflaccid; spikes in umbels of 2—6, erect or stellately spreading; tips of the rhachis barren, mucroniform, usually curved.

Species 3; 1 widely spread throughout the tropics.

119. **Dactyloctenium aegyptium** (L.) Willd. Enum. Plant. hort. Berol. (1809), p. 1029. — Boiss. Fl. Or. V, p. 556. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 171 no. 1196. — *Cynosurus aegyptius* L. Spec. Plant. I, p. 72. — Annual 10–40 cm high: stems sometimes prostrate, rooting from the proliferously branched nodes: culms geniculately ascending, compressed, 2—3-noded, glabrous, smooth, internodes exserted; sheaths striate, the lower whitish, keeled above, glabrous, or scantily hispid; ligules membranous, very short, scantily ciliate; blades linear, tapering to a fine point, 2—10 mm long, 2—4 mm broad, flat, subflaccid, glaucous, glabrous or hispid or hispidly ciliate, hairs tubercle-based: spikes 2—6, rarely solitary, 0.5—4 cm long, light or dark olive-grey; rhachis keeled, scabrid; spikelets 3—5-flowered, spreading at right angles, up to 3 mm long,

glabrous; lower empty glume about 0,75 mm long, the upper cuspidately mucronate or awned; awn curved, sometimes exceeding the glume; flowering glumes 2—3,5 mm long, mucronate or awned; anthers about 0,5—0,75 mm long; grain 0,5—1 mm long, very rugose, reddish. — Flow. January to March. —

M. ma. Alexandria, Ramle, common in cotton fields; Abukir, in sandy places not rare. — **N. d.** Rosetta in gardens and cotton fields; Tanta, as common weed in fields; Zaqaziq, not rare; Khauka; environs of Cairo. — **N. v.** Beni-Suêf, in fields. Feshn. Minia, Kôm-el-Ahmar in fields, not rare; Aswân, common. — **O.** Qasr Dakhel; Kharge in the Great Oasis.

Local name: rigl-el-herbâye (Delile); generally in es-salib.

Also known from Nubia, Erythraea, Arabia and in other countries of Tropical Asia and America.

55. (38.) **Pappophorum** Schreb.

Spikelets 3-flowered, paniculate; rachilla disarticulating above the glumes, minutely scaberulous or almost smooth. Lowest flower bisexual, the intermediate male or barren, the uppermost rudimentary, minute. Glumes 2, persistent, membranous, acute or obtuse or minutely truncate, 3—5- or sub-7- nerved. Bisexual flower: flowering glume very broad, rounded on the back, rather firm, more or less villous, 9-nerved, 9-awned; awns subulate, equal or subequal, plumose, ciliate or scaberulous; callus minute, short; pale oblong, 2-keeled, exceeding the flowering glume; lodicules 2, minute, cuneate, fleshy; stamens 3; ovary glabrous; styles distinct, short; stigmas laterally exserted, loosely plumose. Second flower like the lower, but the flowering glume about $\frac{1}{2}$ as long, glabrous, the ovary rudimentary or suppressed. Uppermost flower reduced to a tuft of minute awns. Grain oblong, dorsally more or less compressed; hilum punctiform, subbasal; embryo large, occupying $\frac{3}{4}$ or more of the fruit. — Perennial, rarely sub-annual; blades usually narrow, often convolute; ligules reduced to a line of hairs; panicle contracted, more or less spike-like, elegantly bristly-plumose from the numerous awns.

Species about 6 in the dry and warm regions of the Old World and in Australia, 1 in Western North America.

120. **Pappophorum brachystachyum** Jaub. et Spach in Ann. scienc. nat. ser. 3, XIV (1850), p. 365 and Ill. Plant. Or. II (1850—1853), tab. 324. — Boiss. Fl. Or. V, p. 558. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 171 no. 1198. — Enneapogon brachystachyum Stapf in Flor. Cap. VII, p. 654. — Perennial, often compactly caespitose, all parts finely glandular-pubescent, rarely subglabrous; culms fasciated, geniculately

ascending, 4—12 cm long, slender, often with a bulbous thickening at the base, 2—4-noded, simple or sparingly branched below, internodes mostly exserted; leaves mostly near the base; sheaths tight or those at the base of the branches loose, finely striate, nodes pubescent to villous; blades very narrow, linear, finely attenuated, 2—10 cm long, usually setaceously convolute, sometimes more or less scabrid; panicle spike-like, 1—4 mm long, 6—10 mm broad, dense, light to dark grey; spikelets 2,5—4 mm long; glumes subequal, oblong, obtuse or emarginate, scantily pubescent, thin, usually 5- (rarely 3- or 7-) nerved, lateral-nerves evanescent above; lower flowering glume 1 mm long, shortly villous; awns about 2—4 mm long, shortly plumose to or beyond the middle; pale 2 mm long; keels scabrid; anthers ellipsoid-oblong, 0,3—0,5 mm long; grain almost 1 mm long. — Flow. March to April.

D. a. mer. Wady Etit, Mirsa Wady Lekhuma near the Red Sea coast.

Also known from Nubia and Arabia.

56. (39.) **Boissiera** Hochst.

Spikelets terete, 5—6-flowered, the flowers closely imbricated along the axis, the lower 2—3-perfect, the rest reduced to a pale. Glumes 2, membranous, many-nerved, somewhat unequal, much shorter than the flower. Lower glume coriaceous, linear, concave, many-nerved, ending in a hyaline, frayed-dentate tip; awns 7—9, scabrous, somewhat twisted, dilated at base, inserted at the base of the hyaline tip. Pale as long as the flowering glume, but narrower, 2-keeled, 2-toothed. — Dwarf annuals, with aspect of *Bromus rubens*. —

A small genus of only one species in the Orient. —

121. **Boissiera Pumilio** (Trin.) Hackel in Denkschrft. Math.-nat. Classe Kais. Akad. Wiss. Wien, L (1885) II, p. 9. — Boiss. Aschers.-Schweinf. III. Fl. d'Eg., p. 190. — Sickenberg. Contrib. Fl. d'Eg., p. 309. — *Boissiera bromoides* Hochst. ex Steud. in Flora (1838), p. 25. — Boiss. Fl. Or. V, p. 560. — Aschers.-Schweinf. III. Fl. d'Eg., p. 171 no. 1200. — *Pappophorum Pumilio* Trin. in Mém. Acad. Petersb. Sér. VI, 1 (1831), p. 92. — 6—15 cm high, appressed-puberulent; culms solitary or tufted, ascending or erect, often geniculate below, leafy to the base of the inflorescence. Panicle fasciculate-capitate, obovate, 3—4 cm long; glumes lanceolate, one-third of the length of the lowest flower, acute, the upper somewhat longer, sometimes mucronulate; flowering glume 11—13-nerved, more or less hirsute below awns, terminal membrane one-fifth as long as the flowering glume, the longest

awns twice to thrice as long as the flowering glume. — Flow. April. —

D. a. sept. Wady Rutey, Northern Galala; Southern Galala: Wady Azkhar. —

Also known from Arabia, Persia and Afghanistan.

57. (40.) *Schmidtia* Steud.

Spikelets closely 4—6-flowered; rachilla disarticulating above the glumes and between the flowers, joints extremely short, glabrous. Flowers bisexual, except the rudimentary uppermost one. Glumes 2, persistent, membranous, acute or subobtuse. 9—11-nerved. Flowering glumes broad, rounded on the back, rather firm and villous below. 9-nerved. 5 of the nerves excurrent into straight subulate scabrid awns, the 4 alternate ones into very thin lanceolate mucous lobes; callus slender, minute, bearded. Pales oblong, 2-keeled, rather longer than the body of the glumes. Lodicules 2, minute, cuneate, fleshy. Stamens 3. Ovary glabrous; styles distinct, slender; stigmas laterally exserted; loosely plumose. Grain oblong, dorsally compressed; hilum punctiform, subbasal; embryo large, occupying $\frac{3}{4}$ or more of the back of the grain. — Perennial or annual (?), more or less glandular-pubescent; blades rather rigid, flat or convolute; ligule a line of hairs; panicle contracted, narrow, oblong or spike-like; spikelets turgid, many-bristled. —

Species 3—4, closely allied, in tropical and South Africa.

122. *Schmidtia quinqueseta* Benth. mss. ex Ficalho et Hiern in Trans. Linn. Soc., ser. 2. II (1881), p. 31. — Boiss. Fl. Or. V, p. 559. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 171 no. 1199. — Perennial, with numerous villous conical innovation-buds at the base, base hence less or more bulbous; culms simple or scantily branched, erect or shortly ascending, up to 60 cm long, 5—8-noded, villous or pubescent below the nodes, internodes mostly enclosed or subexserted; leaves villous or pubescent or glabrescent; sheaths striate, the upper tight; blades linear, long and finely attenuated, 4—8 cm long, 4—6 mm broad, usually convolute at least above the middle, firm, rather rigid; panicle linear to oblong, 2—8 cm long, 12—20 mm broad, somewhat loosely contracted; branches up to 1 cm long, 3—7 spiculate; spikelets 8—10 mm long; glumes pubescent, nerves prominent, the lower 6—8 mm long, ovate, the upper 8—10 mm long, oblong; body of flowering glumes 2—4 mm long, linear-lanceolate, lobes about 3 mm long; awns 6—8 mm long; flaps of pales long silky; anthers 2—3 mm long; grain 0.75 mm long. — Flow. March to April.

O. Great Oasis: 'Ain Fakhme near Mex.

Also found in Senegambia, Darfur, Hereroland, South Africa and Kalahari.

58. (41.) **Diplachne** P. Beauv.

Spikelets shortly pedicelled or subsessile, somewhat distant or remote on the simple slender branches of a panicle; rhachilla disarticulating above the empty glumes and between the flowering glumes, glabrous. Flowers 2—10, bisexual, or the uppermost reduced. Empty glumes unequal or subequal, membranous, 1-nerved, keeled, persistent. Flowering glumes oblong to linear-oblong, 2-toothed or minutely notched, rarely quite entire, mucicous or mucronulate from the sinus, very rarely shortly awned from below the apex, membranous, 3-nerved, usually finely ciliate in the lower part of the nerves or sometimes quite glabrous; lateral nerves percurrent or almost (or sometimes very shortly) excurrent. Pales 2-keeled, shorter than the flowering glumes. Lodicules 2, cuneate, fleshy, nerved. Stamens 3. Ovary glabrous; styles distinct, slender; stigmas plumose, laterally exerted. Grain enclosed by the slightly altered flowering glume and pale, oblong to obovoid-oblong, dorsally compressed, sometimes quite flat, rarely terete; embryo equalling $\frac{1}{3}$ — $\frac{1}{2}$ the length of the grain; hilum punctiform, basal. — Mostly perennial, tufted, somewhat coarse grasses; blades long, narrow, flat or involute; ligules membranous, sometimes reduced to a rim; panicle consisting of slender, usually long, simple, loosely spike-like and more or less distant branches; spikelets light or olive-green, often tinged with purple and dark.

Species about 12, mainly in the warm regions of the Old World and in North America.

- A. Perennial. Culms erect or ascending, 30—80 cm long, usually 3—5 noded; blades 6 to 12 cm long, flaccid or subrigid 1. **D. fusca**.
 B. Annual. Culms fascicled, scarcely more than 5 cm long, blades 2—3 cm long, rigid, curved, folded 2. **D. nana**.

123. **Diplachne fusca** (L.) Beauv. Essai Agrost. (1812), p. 163. — Boiss. Fl. Or. V, p. 591. — Aschers-Schweinf. Ill. Fl. d'Eg., p. 1201. — Festuca fusca L. Spec. Plant. ed. II. p. 109. — Delile Fl. d'Eg., p. 24 tab. XI fig. 1. — Bromus polystachyus Forsk. Flor. aeg.-arab., p. 23. Perennial, glabrous; culms tufted, stout, geniculately ascending or erect, often branched from the lower nodes, 30—80 cm long, terete, smooth, 3—4-noded, or many-noded when branched, internodes enclosed except the uppermost or shortly exerted; sheaths smooth, almost shining or the upper rough, the basal whitish, slightly compressed, bluntly keeled; ligules hyaline, oblong, acute, up to 5 mm long; blades very narrow, linear, tapering to a fine often subpubescent point, 6—12 cm long, 2—3 mm broad when expanded, folded

or convolute or sometimes flat, rather rigid, rough on both sides, rarely almost smooth below; panicle erect straight or slightly nodding, obovate-oblong to linear, contracted or open; rhachis slender, angular, rough; branches scattered or 2—3 close together, often more or less flexuous, the longest 6—10 mm long, usually racemose; pedicels short; spikelets distant by half their length or more, narrow, oblong, 6—10 mm long, 10—20-flowered, usually dark olive-grey, rarely light or whitish; empty glumes lanceolate oblong, obtuse or acute, often obscurely mucronate, the lower about 1 mm long, the upper 2—3 mm long; flowering glumes oblong, tips broad, entire or minutely emarginate, and with a tooth on one or both sides, middle and lateral nerves excurrent into a short or obscure mucro, or only the former, side-nerves silkily ciliate below; callus hardly; pales minutely 2-toothed, flaps hairy along the keels; anthers 1 mm long; grain oblong, dorsally compressed, up to 1 mm long; embryo almost $\frac{1}{2}$ the length of the grain. — Flow. March to April.

N. d. Damietta, mouth of the Nile, abundant; Rosetta, on banks of the Nile; Miniet-Murshid; Menzale; Fua; San; Benha-el-asl; Cairo; Mansura; Tanta; Damanhur; Zaqaziq, common. — **N. f.** Medinet-el-Fayûm, near Elbgig in ditches; El-Qaraq, in canals and ditches not rare; banks of the Bats near Moqutele. — **N. v.** Giza; Beni-Suêf; Minia, common; Ekhmim; Girga; Kene; Luksor; Aswân, common.

Local name: heyshe; hish; safûn; seyfûn (Ascherson); khirs (G. Roth); abu naga (Del.); abu rukbu (Forsk.) —

Widely spread throughout the warm regions of the Old World, mainly near the water.

124. (2.) **Diplachne nana** Nees Flor. Afr. austr. (1841), p. 259. — Boiss. Fl. Or. V, p. 562. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 171 no. 1202. — Triraphis nana Hackel in Englers Bot. Jahrb. XI, p. 403. — Annual, scarcely more than 5 cm high, the whole plant reddish; culms fascicled, straight above the subbasal node, terete, striate, finely scaberulous; peduncle long exserted; sheaths rather loose, short, striate, with scattered fine stiff tubercle-based hairs; blades linear-lanceolate, acuminate, 8 mm long and 2 mm broad when expanded, rigid, curved, folded, striate, scaberulous; panicle spike-like, ovate to oblong, 6—8 mm long; branches 6—1-spiculate, scaberulous, erect, up to 4 mm long; pedicels up to 1 mm long; spikelets 5—7-flowered, up to 4 mm long; empty glumes acutely keeled, mucronate, straw-coloured, the lower lanceolate, up to 1 mm long, the upper oblong, obtuse, up to 1 mm long; flowering glumes oblong, 1 mm long; middle awn as long as the glume,

lateral awns somewhat longer than the middle lobe; pale glabrous, keels scabrid; anthers 6,2—6,5 mm long; grain linear, terete 1,2 mm long, 6,3 mm broad. — Flow. April.

D. a. mer. Wady Tundela; Wady Gadira; Wady Etit near the Red Sea coast near Mirsa Wady Lekhuma, in sandy places.

Also known from Nubia and South Africa (?).

59. (42.) *Arundo* Linn.

Spikelets 2—7-flowered, laterally compressed, in very compound panicles, rachilla disarticulating above the empty glumes and between the flowering glumes, joints short, glabrous; flowers bisexual, the uppermost reduced. Glumes equal, broadly lanceolate, shortly acuminate, keeled, membranous, 3—5-nerved. Flowering glumes more or less equalling the empty glumes, ovate to lanceolate-ovate, acuminate, finely bifid or entire, long hairy below, 5—9-nerved, 3 nerves more or less percurrent or excurrent, the rest short, the middle nerve often produced into a short fine bristle; callus short, shortly bearded. Pales slightly exceeding $\frac{1}{2}$ the length of the flowering glume, 2-keeled. Lodicules 2, obovate, nerved, glabrous. Stamens 3. Ovary glabrous; styles distinct, almost as long as the laterally exerted plumose stigmas. Grain obovoid-oblong, broad, loosely enclosed by the flowering glume and pale; hilum basal, punctiform; embryo occupying almost wholly one side of the grain. — Perennial with creeping rhizomes, extravaginal shoots and very tall and stout woody culms; leaves rather equally distributed over the culms; sheaths slightly exceeding the internodes; blades long, broad, flat, ligules very short, membranous; panicles large, much compound; spikelets hairy. —

Species 1, all over the Mediterranean regions to the Himalaya; introduced into America and South Africa.

125. *Arundo Donax* L. Spec. Plant. I (1753), p. 81. — Boiss. Fl. Or. V, p. 564. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 171 no. 1204; glabrous; culms erect, 1—3 m long, smooth, hollow, very many-noded, simple or scantily branched, internodes slightly exceeded by the sheaths, these very tight, firm, smooth; blades linear-lanceolate from a broad base, long tapering to a very fine point, more or less drooping, 30—60 cm long, 2—5 cm broad, smooth; panicles erect, 30—60 cm long; branches scaberulous, erect or drooping; spikelets 8—10 mm long, light brown; empty glumes glabrous; flowering glumes 6—10 mm long; hairs 5—6 mm long; anthers 3 mm long; grain 2.5 mm by almost 1 mm long. — Flow. April to May.

M. ma. Alexandria: Galari; Ramle. — **M. p.** Port-Said. not common. — **N. d.** Matariyal (Sake Menzale) Tanta; Qalyub; railway ditches N. from Cairo; not common.

Local name: bûs-fârish (Aschers.); qasab (Del.); bus haggai (Forsk.) Gûb-rumy (Damietta, Ascherson and Schweinf.), ghâb (Schweinf.-Muschler).

Known from the other parts of Northern Africa and Asia.

60. (43.) **Phragmites** Trin.

Spikelets loosely 3—10-flowered, awnless, in large panicles; rhachilla disarticulating above the first and between the following flowering glumes, slender, glabrous, joints very short; lowest flower male or abortive, the following bisexual, the uppermost flowers reduced. Empty glumes thin, unequal to subequal, lanceolate, acute, more or less rounded on the back, 3-nerved, or the lowest sometimes sub-5-nerved. Flowering glumes heteromorphous, the lowest linear-lanceolate, much longer than the subtending glume, otherwise of a similar structure, quite glabrous, persistent, the following glumes very thin, linear, long and more or less caudate-acuminate, 3-nerved, middle nerve percurrent, lateral nerves fine, short, callus long, slender, with very long silky hairs. Pales linear-oblong, about $\frac{1}{2}$ as long as the glumes, 2-keeled. Lodicules 2 (or sometimes 3 in the lowest flower) obovate, 2—3-nerved, glabrous. Stamens 3, or 2 in the lowest flower. Ovary glabrous, in the lowest flower rudimentary or quite suppressed; styles distinct, rather short; stigmas laterally exerted, densely plumose. Grain loosely enclosed by the glumes and pale, free, oblong, semiterete, hilum oblong, short basal; embryo about $\frac{1}{2}$ as long as the grain. — Perennials with a creeping rhizome, extravaginal innovation shoots, and tall sheathed annual or perennial culms; blades flat; ligule a narrow, ciliate, membranous rim; panicle lax, usually very large and much compound; spikelets conspicuously silky from the long callus hairs.

Species 1 (or 2, very closely allied), almost cosmopolitan.

126. **Phragmites communis** Trin. Fund. Agrost. (1820), p. 134. — Culms erect, 120 cm to 3 m high, sometimes much taller or dwarfed, many-noded, usually sheathed all along; sheaths embracing each other, tight, terete, smooth, glabrous the lowest with reduced blades or bladless, firm; blades linear to lanceolate, tapering to a setaceous or subulate point, very variable in length and width up to 40 cm long and 1 to 3 cm broad, firm, more or less glaucous below, glabrous, smooth or slightly rough towards the base, margins smooth or scabrid; panicle oblong to ovate-oblong, erect or nodding.

more or less secund, dense, brownish-purple or brownish-yellow, branched, fascicled or the upper solitary. the longest 15 to 20 cm long, loosely and repeatedly branched, like the rhachis angular and scabrid, ultimate branchlets more or less terete, filiform; lateral pedicels usually 2—4 mm long, the terminal up to 8 mm long; spikelets 3—4 mm long; glumes 3—5 mm and 4—6 mm long respectively; lower glume oblong-linear, like the following glumes 4—10 mm long, callus to 1 mm, hairs to 6 mm long; anthers about 2 mm long; grain 0.75 mm long. —

— var. **isiaca** (Del.) Cosson in Coss. and Dur. Explor. scient. Algér. II (1854—1867), p. 125. — Boiss. Fl. Or. V, p. 563. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 171 no. 1203. — *Arundo isiaca* Del. Fl. aeg. Illustr., p. 4. — *Arundo maxima* Forsk. Fl. aeg.-ar., p. 24. — Leaves often very broad. Panicle broader than in the type. — Flow. September to December. —

M. ma. Alexandria and environs, very common. — **M. p.** Rosetta, common along the canals; Damietta; Lake Menzale. — **N. d.** Mansura; Belbeys; Shubra near Cairo; along Khaliq near Cairo; Island Roda; Tanta; Zifta; everywhere common. — **N. f.** Medînet-el-Fayûm; Senuris, common; Senhûr; Tomia; Kafr Mukfût, not rare. — **N. v.** Cairo. Pyramids; Beni Hassam; Siût, on the sides of irrigation canals everywhere; Malatiya; Minia; Luxor, rare. — **O.** Great Oasis: 'Ain Taul, common; Dakhel, 'Ain Shenif, not rare; Farâfra, common on the ditches. — **D. i.** Bir Abu Bullu; Ramses. — **D. a. sept.** Serapeum near Suez; Turra near Helwan; Helwan, on the sides of irrigation ditches; Suez, Ain Musa. —

Local name: bûz hâgney (Schweinf.) bûz haggny, haggny; ghâb (Ascherson) ghâbrîhy (Damietta-Ascherson).

Also known from the Mediterranean region and Abyssinia.

— — var. **stenophylla** Boiss. Fl. Or. V (1884), p. 563. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 171 no. 1203. — Leaves shorter, narrower, linear, often convolute and pungent. — Flow April to May.

O. Siwa; Great Oasis: El 'Ayûn near Mex; 'Ain Dakhakhîn; 'Ain-Taul near El-Kharge, not rare. — **D. l.** Kafûr Rahîm near the Pyramids of Giza; near the Pyramids of Zâwîyet-el-'Aryân. — **D. a. sept.** Wady et-Tîh near Tûra; Mouth of the Wady abu-shusha near Helwan; Suez. —

Local name: ghâb (Muschler).

Habit somewhat like *Sporobolus pungens*. Also known from Sinai and Syria.

61. (44.) ***Ammochloa* Boiss.**

Spikelets laterally compressed, 7—15-flowered, flowers perfect. Glumes shorter than lower flowers, ovate-oblong, acute, somewhat unequal, scarious-margined, keel to one side, with a broad, scarious wing. Flowering glume cariateous, scarious-margined, ovate-oblong, tapering into a somewhat prickly point; pale shorter and narrower, hyaline, linear-lanceolate, ciliate at the two keels. — Annuals, with spikelets in a 2-ranked, flattened, globular to oblong spike, with a sort of involucre of abortive spikelets.

A small genus of only 2 species in Northern Africa.

127. ***Ammochloa palaestina* Boiss.** Diagn. Plant. Or. ser. 1, XIII (1853), p. 51. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 171 no. 1205. — Sickenberg. Contrib. Fl. d'Eg., p. 309. — *Ammochloa subacaulis* Balansa Bull. soc. bot. Franc. I, p. 317. — 3 to 7 cm high, tufted. Heads nearly sessile, clustered among radical leaves half-buried in the sand, or on culms shorter than the leaves. Leaves membranous, dilated at the base, linear, elongated, flexuous. Spikelet laterally compressed. — Flow. March to May.

M. ma. Mirsa Matruqa; Mandara near Alexandria, in sandy places; Mariut; Ramle, in sandy places. — **M. p.** Rosetta, Damietta, in sandy places; Between Qatiya and El-Arish at desert places and beyond that city. — **D. i.** Ismailia.

Also known from Sinai and Syria.

62. (45.) ***Lamarekia* Moench.**

Spikelets dimorphic, fascicled, in dense unilateral panicles; fascicles deciduous, consisting usually of 5 spikelets, 2 of them awned, 3 awnless, elongated, many-glumed, barren; one of the awned spikelets imperfect and paired with the lowest awnless spikelet, the other fertile between the other 2 awnless spikelets. Fertile spikelet: rhachilla slender, tough; flowers 2, lower bisexual, upper barren; glumes subequal narrow, linear-lanceolate, acuminate, 1-nerved, keeled; lower flowering glume ovate-oblong (linear-oblong in profile), rounded on the back, thin, finely 5-nerved, awned from below the apex; awn fine, straight, callus obscure; upper flowering glume empty, minute, delicate, 1-nerved, awned at or below the middle; pale narrow, 2-keeled; lodicules 2, minute, delicate, nerveless; stamens 3; anthers minute; ovary obtuse, glabrous; styles distinct, very short; stigmas very slender, barbellate terminally exerted. Barren awned spikelet similar, smaller, with a single glume, like the upper flowering glume in the fertile spikelet. Awnless spikelets long; rhachilla tough, somewhat pilose, wavy, thickened at the nodes; glumes rather

broader than in the awned spikelet and more or less asymmetric; glumes empty, broad, truncate, hyaline, 3-nerved, the upper imbricate. Grain tightly embraced by the glume and pale, adhering to the latter. linear-oblong, grooved; embryo oblong, short; hilum linear, $\frac{1}{4}$ the length of the grain. — Annual, small, glabrous; culms numerous; leaves flat; panicle very elegant, glistening; fascicles of spikelets ebracteate, jointed on the branches, at length deciduous, nodding; fertile spikelet quite hidden by the awnless spikelets.

Species 1, Mediterranean, occasionally found as an alien in other countries.

128. **Lamarekia aurea** (L.) Moench Meth. Plant. Marb. (1794), p. 201. — Boiss. Fl. Or. V, p. 570. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 171 no. 1206. — Sickenberg. Contrib. Fl. d'Eg., p. 309. — *Cynosurus aureus* L. Spec. Plant. I, p. 73. — Culms 6—7 cm long, usually with 1 or more intravaginal branches near the base, slender, smooth, few-noded, internodes enclosed except the uppermost; leaves rather crowded near the base; sheaths loose, thin, smooth; ligules membranous, hyaline, oblong, acute, up to 8 mm long; blades linear, tapering to an acute or setaceous point, 5—10 cm long, 4—8 mm broad, smooth; panicle oblong to linear, 2—6 cm long, 1—2.5 mm broad, light green or straw-coloured, rarely purplish or variegated; branches solitary or the lowest 2-nate, flexuous, nodding; branchlets glabrous below, hispidulous above the joint as are the short pedicels; fertile spikelet about 4 mm long; rhachilla joints glabrous, the basal 1 mm, the upper up to 1 mm long; glumes slightly exceeding the flowering glumes; lower flowering glume almost 3 mm long; awn 6—8 mm long; anthers about 0.75 mm long; grain 1.75 mm long; barren spikelets 4—8 mm long; flowering glumes white, 1—2 mm long or less. — Flow. April to May.

M. ma. Matruqa; Abukir; Alexandria, Ramle, in sandy places. — **D. i.** Desert el Tih.

Mediterranean countries from the Canaries to the Punjab and Abyssinia.

63. (46.) *Cynosurus* Linn.

Spikelets dimorphic, laterally compressed, shortly pedicelled or subsessile, fascicles gathered in usually dense spike-like unilateral panicles, the terminal spikelet of each fascicle fertile, the lateral barren, more or less concealing the former; rhachilla readily disarticulating and short-jointed in the fertile, tough in the barren spikelets. Fertile spikelets: flowers 1—5, bisexual or the uppermost rudimentary; glumes equal or almost so, subulate to lanceolate, 1-nerved, more or less hyaline, slightly longer or shorter than the florets; flowering glumes oblong to lanceolate in profile, rounded

on the back, minutely or obscurely 2-toothed, mucronate or awned from close below the tip, membranous, 5-nerved; callus small, obtuse, glabrous; pales subequal to the glumes, 2-keeled, 2-toothed; lodicules 2, small, oblong; stamens 3; ovary glabrous; styles distinct, short; stigmas loosely plumose, laterally exerted. Grain oblong, rounded on the back, grooved in front, more or less adhering to the glume and pale; hilum linear, short; embryo small. Barren spikelets consisting of more or less numerous persistent undifferentiated bracts, the lower narrow subulate to lanceolate, somewhat distant and spreading, upper broader to ovate, closer to imbricate, all or at least the lower passing into bristle-like awns. — Annual or perennial, scantily fascicled to caespitose; blades flat, more or less flaccid; ligule hyaline; panicle usually very dense, rarely somewhat loose, spike-like or capitate, secund; sterile and fertile spikelets very dissimilar, the former placed outside and more or less concealing the latter.

Species 2 or 3, in the Mediterranean countries, 1 all over Europe.

129. **Cynosurus coloratus** Lehm. ex Steud. Nomencl. bot. ed. I, I (1840), p. 365. — Boiss. Fl. Or. V, 571. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 172 no. 1207. — A slightly tufted plant, with short, narrow leaves, mostly radical, and a slender, often wiry erect stem, from 10 to 50 cm high. Flowering spike semi-cylindrical, oblong or nearly linear, 2—6 cm long; the clusters regular, and all turned to one side; the outer elegantly pinnate; barren spikelets being the most conspicuous, and forming a kind of involucre to each cluster, within which are 1 or 2 fertile spikelets, each with 3 to 5 flowers. The glumes, whether empty or flowering, all terminate in a very short point. — Flow. Januar to February.

M. ma. Mariut near Alexandria.

Also known from Marmarica, Cyrenaica and the Cap colony.

64. (47.) **Koeleria** Pers.

Spikelets laterally compressed in spike-like panicles; rhachilla glabrous or finely hairy, disarticulating above the glumes and between the flowering glumes, produced with or without a rudimentary glume. Flowers 1—5, bisexual, or the uppermost more or less reduced. Glumes 2, persistent, subequal or unequal, subacute to acuminate, keeled, the lower usually 1-nerved or like the upper 3-nerved, margins hyaline. Flowering glumes exceeding the empty ones, acute or obtuse with the margins and tips broadly hyaline, 3—5-nerved; lateral nerves usually faint, conniving above, middle nerve percurrent or excurrent into a mucro or a short subterminal awn; callus very

minute, glabrous. Pales shorter than the flowering glumes or almost as long, 2-keeled, 2-toothed, conspicuously hyaline and white. Lodicules 2, hyaline. Stamens 3. Ovary glabrous; styles distinct, very short, stigmas laterally exerted, plumose. Grain oblong, laterally compressed, whitish, soft, tightly embraced by the hardened back of the valve; hilum basal, short, obscure; embryo small. — Perennial or annual; blades usually very narrow; ligules hyaline; panicle usually cylindric, often interrupted, glabrous and glistening from the hyaline white margins of the glumes and pales, or more or less hairy.

Species 12—15, mainly in Europe, North Africa, and temperate Asia. 1 species almost cosmopolitan.

A. Panicle dense, cylindrical; glumes unequal . . . 1. **K. phleoides**.

B. Panicle loose, ovate-lanceolate; glumes unequal . 2. **K. Rohlfssii**.

130. (1.) **Koeleria phleoides** (Vill.) Pers. Syn. Plant. I (1805), p. 97. — Boiss. Fl. Or. V, p. 572. — Aschers.-Schweinf. Ill. Fl. d'Ég., p. 172 no. 1208. — Festuca phleoides Vill. Hist. Plant. Dauph. II, p. 93. — Annual; culms tufted, geniculate, erect or ascending, from a few cm to more than 30 cm long, smooth, glabrous, 2—3- (rarely 4-) noded, simple or sometimes with a flowering branch from one of the lower nodes; leaves more or less softly hairy to villous; sheaths rather loose or the upper tight, thin; ligules hyaline, delicate, toothed, up to 1 mm long; blades linear, tapering to an acute point, 2 to more than 12 mm long, 1—8 mm broad, flat, flaccid; panicle spike-like, cylindric, sometimes lobed, 1—6 cm by 6—14 mm, very dense; branches repeatedly and very shortly branched from near the base, glabrous and smooth like the rachis; pedicels very short, scantily scabrid or glabrous; spikelets ovate-oblong, 4—5 mm long; flowers 3—7; rachilla very shortly ciliolate, joints short; glumes glabrous or scantily pubescent, or scaberulous in the upper part, lower narrow, lanceolate, acute, 1—2 mm long, 1-nerved, upper much broader, slightly longer, 3-nerved; flowering glumes oblong, always entire but easily splitting to the base of the very fine mucro or awn (up to 3 mm long) and then 2-toothed, 1—3 mm long, glabrous or subpubescent, often scabrid, prominently 5-nerved, the upper often different, barren, strongly, compressed and recurved; anthers 0.5 mm long; grain up to 1 mm long. — Flow. Februar to March.

M. ma. Alexandria, on calcareous rocks; Mex. Ramle, Mandara, Mariut, Mergheb, Abukir, everywhere on calcareous ground. — **M. p.** Rosetta, Abu Mandur, in sandy places; Damietta, Kafr el Battikh, in sandy places; el-Arish. — **D. l.** Abu Roash, in sandy places and on the margins of fields; Pyramids of Giza and Saqqâra. — **D. a. sept.**

Kafr hakim, near Cairo in sandy places; in the desert near Helwan not rare. —

Throughout the Mediterranean Region to North-West India; also in Abyssinia.

I have refrained from describing varieties of this extremely variable grass as I find the characters used for this purpose by other authors to unstable, even in specimens from the same locality, and entering into to many more or less distinct combinations as to defy any satisfactory classification.

131. (2.) **Koeleria Rohlfssii** (Aschers.) Murbeck in Contrib. Flor. du Nord-Ouest de l'Afrique IV (1899), p. 16 fig. 5 and tab. XIII fig. 9—12. — *Trisetum Rohlfssii* Aschers. Sitzber. Ges. Naturf. Freunde, Berlin (1879), p. 49 and in Bot. Verein Prov. Brandbg. XXI (1879), p. 71. — Boiss. Fl. Or. V, p. 534. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 170 no. 1183. — Annual; culms tufted, geniculate, erect or ascending, from 5 to 20 cm long, smooth, densely hairy, 2—3-noded, simple or sometimes with a flowering branch from one of the lower nodes; leaves more or less softly hairy to villous; sheaths rather loose or the upper tight, thin; ligules hyaline, delicate, toothed, up to 1,5 mm long; blades linear, tapering to an acute point, 1 to 6 cm long, 1,5—2,5 mm broad, flat, flaccid; panicle ovate-lanceolate, up to 7,5 cm long, 1 cm broad, very loose; branches repeatedly and very shortly branched from near the base, glabrous and smooth like the rachis; pedicels very short, scantily scabrid or glabrous; spikelets cuneate-ovate, 4—5,2 mm long, 1 mm broad; flowers 2—4; rachilla very shortly ciliate, joints short; glumes glabrous, unequal, subtrinnerved, shorter than the flowers, linear-lanceolate, acuminate; flowering glumes oblong, always entire, glabrous or subpubescent, often scabrid, prominently 5-nerved; anthers 0,25 mm long; grain up to 1 mm long. — Flow. April.

O. Little Oasis: In sandy places of Qasr-Bauiti, rare. —

Also known from Tunisia.

65. (48.) **Sphenopus** P. Beauv.

Spikelets laterally compressed, somewhat remotely 2—5-flowered, the uppermost flower usually tabescent. Glumes membranous, concave, 1-nerved, shorter than the flowers. Flowering glume herbaceous, 5-nerved, the back convex, somewhat inflated at the base, mucicous, upper glume membranous, 2-keeled. — Perennial herbs; spikelets panicle.

Only two species in the Mediterranean Region.

- A. Culms 10—20 cm high, ligule elongate; spikelets
5—7-flowered **S. divaricatus.**
B. Culms 3—6 cm high, ligule setaceous; spikelets
3-flowered **S. Ehrenbergii.**

132. (1.) **Sphenopus divaricatus** (Gouan) Reichb. Fl. Germ. excurs. I (1830), p. 45. — Boiss. Fl. Or. V, p. 575. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 172 no. 1209. — Sickenberg. Contrib. Fl. d'Eg., p. 309. — *Poa divaricata* Gouan Illustr. et Observ. IV tab. 2. — Annual 10—20 cm high; culms slender, geniculate at the base, ascending. Leaves narrow-linear, channeled, at length involute. Panicle at first compact, then diffuse; pedicels cylindrical-club-shaped, crowned with the persistent glumes; glumes obtuse, shorter than the flowers, the upper thrice as long as the lower; lower glume scarious at the tip, obtuse, somewhat keeled. — Flow. February to March.

M. ma. Râs-el-Kenâ'is; Abusir; Alexandria, Mex, Mariut, everywhere in sandy places or in fields, not common. — **M. p.** Damietta; El-Arish. —

Throughout the Mediterranean Region.

133. (2.) **Sphenopus Ehrenbergii** Haussknecht in Mittlg. Thüring. Bot. Verein N. F. XIII (1899), p. 57. — *Sphenopus syrticus* Murbeck Contr. Flor. Nord-Ouest de l'Afr. IV (1900), p. 19. — *Festuca Ehrenbergii* Aschers. and Graebner Synops. mitt.-europ. Flor. II. 1, p. 564. — Annual, 3—6 cm high; culms slender, geniculate at the base, ascending. Leaves narrow-linear, channeled, at length involute. Panicle at first compact, then diffuse, pale greenish rigid-pedicels cylindrical club-shaped, crowned with the persistent glumes; glume acuminate, shorter than the flowers, the upper twice as long as the lower; lower glume scarious at the tips, obtuse, somewhat keeled. — Flow. May.

M. ma. Alexandria (Ehrenberg).

Also know from South-Tunisia, Tripolis and Syria (?). —

66. (49.) **Eragrostis** P. Beauv.

Spikelets usually strongly laterally compressed, pedicelled in open or contracted panicles, rarely sessile in simple or compound spikes, very rarely articulate on the pedicels; rachilla disarticulating above the empty glumes and between the flowering glumes or tough and persistent, glabrous, sometimes more or less scaberulous, very rarely minutely hairy. Flowers 2 to many, bisexual or the uppermost reduced. Glumes unequal or equal, usually membranous, 1-nerved, or the upper sometimes 2-nerved, keeled, persistent or deciduous. Flowering glumes more or less imbricate, ovate to

lanceolate, acute or obtuse, entire, mucicous, membranous to chartaceous, 3-nerved, glabrous, very rarely minutely pubescent; lateral nerves short or almost percurrent. Pales equal to the valves or slightly shorter, membranous, 2-keeled, deciduous or persistent on the rhachilla. Lodicules 2, small, cuneate, more or less fleshy. Stamens 3, rarely 2. Ovary glabrous; styles distinct; stigmas plumose; laterally exserted. Grain enclosed by the scarcely altered glume and pale and deciduous with them, or more commonly falling with the deciduous glume, leaving the more or less persistent pale behind, oblong to obovoid or globose, round or very obtusely triquetrous or quadrangular in cross section; pericarp thin, sometimes slightly swelling or separating; embryo often $\frac{1}{2}$ as long as the grain (or sometimes longer); hilum punctiform, basal. — Perennial or annual, of very varying habit; blades narrow; ligule reduced to a fringe of usually minute hairs; panicles loose to effuse or contracted to spike-like, or transformed into simple or compound spikes; spikelets usually more or less olive-green or olive-grey, breaking up variously, very rarely deciduous as a whole.

Species very numerous in the warm parts of the world.

A. Pales persistent with the rhachilla; culms erect, procumbent, or geniculate-ascending. Leaves narrow linear.

I. Keels of pales scabrous.

a) Spikelets pedicelled.

1. Pedicells shorter than the spikelets.

α) Lower glume elliptical, obtuse . . . 1. *E. minor*.

β) Lower glume oblong, retuse, often mucronulate 2. *E. megastachya*.

2. Pedicells longer than the spikelets.

α) Spikelets 20—30-flowered 3. *E. tremula*.

β) Spikelets 5—11-flowered 4. *E. pilosa*.

b) Spikelets sessile or subsessile 5. *E. aegyptiaca*.

II. Keels of pales long and rigidly ciliate . . . 6. *E. ciliaris*.

B. Rhachilla disarticulating; pales falling off with the fruit large; spikelets few; erect; leaves linear or lanceolate, often 5 mm broad, convolute at the tip.

I. Perennial; panicle 25—30 cm long, culms rigid, yellowish 7. *E. bipinnata*.

II. Annual; panicle 5—20 cm long, culms slender, greenish

a) Leaves linear, 8—15 cm long, 4—5 mm broad. Habit of *Eragrostis* 8. *E. nutans*.

b) Leaves lanceolate, 2—4 cm long, 5—15 mm broad. Habit of a little *Eleusine* . . . 9. *E. coelachyrum*.

134. (1.) **Eragrostis minor** Host Fl. Austr. I (1827), p. 135. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 172 no. 1210. — *E. poaeoides* P. Beauv. Ess. Agrost., p. 71. — Boiss. Fl. Or. V, p. 580. — Sickenberg. Contrib. Fl. d'Eg., p. 309. — Annual, tufted; culms geniculate-ascending or suberect, often procumbent, branched below, 10—20 cm long, glabrous, smooth, 3—4-noded, internodes more or less exserted; sheaths loose, strongly striate, keeled in the upper part, glabrous or scantily hairy, bearded; ligule a fringe of short hairs; blades linear or lanceolate-linear, long tapering to a fine point, 10—15 cm long, 3—9 mm broad, flat, more or less flaccid, light green, glabrous or very scantily hairy, smooth below, scaberulous above; panicle ovate-oblong, 6—8 cm long, 1—3 cm broad, branches solitary; pedicels capillary, divergent, shorter than the spikelets; spikelets 5—9 mm long, 1.5—2 mm broad, lanceolate-oblong, 8—20-flowered; flowering glume elliptical, obtuse; pales persistent, somewhat shorter than the glumes; anthers oblong, about 1 mm long; grain subglobose, brown, loose within the turgid glumes. — Flow. March to April.

N. d. Environs of Cairo, in fields and gardens. — **N. v.** Bords of the Beyadieh-Canal near Luksor. Islands near Aswân, in sandy places; environs of the first cataract. common. — **O.** Near Bulak in the Great Oasis; Bêris, in sandy places, not rare; Gyeltûma. —

Throughout the Mediterranean Region from the Canaries to Persia; also extending to middle Europe. —

135. (2.) **Eragrostis negastachya** Link. Enum. Plant. Hort. Bot. Berol. I (1820). p. 87. — Boiss. Fl. Or. V, p. 580. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 172 no. 1211. — Sickenberg. Contrib. Fl. d'Eg., p. 309. — *E. maior* Host Gram. Austr. IV, p. 14 tab. 24. — *Poa multiflora* Forsk. Flor. aeg.-arab., p. LXI no. 58. p. CIV no. 69. p. 21. — *Eragrostis multiflora* Aschers. and Schweinf. Beitr. Flor. Aethiop., p. 299, 310. — Annual, tufted; culms geniculate-ascending or suberect, usually stout and branched below, 8—60 cm long, glabrous, smooth, 3—4-noded, internodes more or less exserted; sheaths loose, strongly striate, keeled in the upper part, often glandular, particularly on the keel and the nerves above, glabrous or scantily hairy, bearded; ligule a fringe of short hairs; blades linear or lanceolate-linear, long tapering to a fine point, 4—12 cm long, 2—8 mm broad, flat, more or less flaccid, light green or subglaucous, glabrous or very scantily hairy, smooth below, scaberulous above, usually glandular along the margins; panicle oblong to ovate-oblong, stiff, 4 to more than 12 cm long, dense or rather loose; axis terete, smooth; branches subsolitary, spreading, stiff or flexuous, lowest up to 6 cm long or all short, branched from near the base; lateral pedicels 1—2¹/₂ mm long, all the

divisions filiform, angular, scabrid; spikelets linear to ovate-oblong, 4—8 mm long by 2 to almost 4 mm subflexuous if very long, light or dark olive-green, few- to 50-flowered; rhachilla persistent; glumes subequal, ovate oblong, subobtuse to acute, 1 or almost 2 mm long, 1- (or the upper 3-) nerved, keels scabrid, margins minutely serrulate; glumes broadly and obliquely ovate in profile, obtuse or subobtuse, 2—2 $\frac{1}{4}$ mm long, lateral nerves prominent, strong; pales persistent, somewhat shorter than the glumes, broad, keels scabrid or ciliolate; anthers oblong, about 0,5—0,75 mm long; grain globose, brown loose within the turgid glumes, 0,75—1 mm in diameter. — Flow. April.

M. ma. Mex. Montaza; Alexandria; Ramle; Abukir, in fields and gardens, sometimes in sandy places. — **N. d.** Alexandria. Canal; Damanhür; Mehallet-el-Kebir; Tanta; Zifta; Zaqaziq; Benhahel-'Asal; Cairo. — **N. v.** Bedrashên, in fields; Siut; Minia; Esne; Ekhnâm; Kene; Luksor; Aswân; islands near Aswân. — **O.** Great Oasis: Gjaui; Dakhel; Qasr Dakhel, in garden. — **D. a. mer.** Wady Etit. —

A native of the Mediterranean regions and India.

136. (3.) **Eragrostis tremula** (Lam.) Hochst. in Schimp. Pl. Abyss. no. 6 and in Flora (1842) I. Beibl. p. 134. — Boiss. Fl. Or. V, p. 581. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 172 no. 1212. — Sickenberg. Contrib. Fl. d'Eg., p. 309. — *Poa tremula* Lam. Ill. genr. Encycl. I, p. 185. — Annual, tufted; culms geniculate-ascending or suberect, usually stout and branched below, 10 cm to 80 cm high, glabrous, smooth, 3—4-noded, internodes more or less exserted; sheaths loose, strongly striate, keeled in the upper part, often glandular, particularly on the keel and the nerves above, glabrous or scantily hairy, bearded; ligule a fringe of short hairs; blades linear or sometimes capillary, long tapering to a fine point 8—15 cm long, flat, more or less flaccid, light green or subglaucous, glabrous, or very scantily hairy, smooth below, scaberulous above, usually glandular along the margins; panicle composite, branched, 10—25 cm long, 5—10 cm broad, pedicels capillary, longer than the spikelets; spikelets compressed, oblong to oblong-linear, 8—15 cm long, 3—4 mm broad, 20—30-flowered; glumes subequal, ovate-oblong; pales persistent, somewhat equalling the glumes; anthers oblong, about 1,5 mm long; grain globose, 1 mm in diameter. — Flow. April to May.

N. d. Environs of Cairo, in fields and gardens as a weed, not rare and growing more frequent every year; Zaqaziq in gardens. — **N. v.** Beni-Suêf, common in fields.

Also known from Senegal and Abyssinia.

137. (4.) **Eragrostis pilosa** (L.) P. Beauv. Essai Agrost. (1812), p. 71. — Boiss. Fl. Or. V, p. 581. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 172 no. 1213. — *Poa pilosa* L. Spec. Plant. I, p. 68. — Annual, tufted; culms geniculate-ascending or suberect, usually stout and branched below, 15 to 60 cm long and often more, glabrous, smooth, 3—4-noded, internodes more or less exserted; sheaths loose, strongly striate, keeled in the upper part, often glandular, particularly on the keel and the nerves above; glabrous or scantily hairy, bearded; ligule a fringe of short hairs; blades linear, often capillary, long tapering to a fine point, 12—25 cm long and more, 1—3 mm broad, flat, more or less flaccid, light green or subglaucous, glabrous or very scantily hairy, smooth below, scaberulous above, usually glandular along the margins; panicle oblong, 6 to 10 cm long, 1 to 2 cm broad, branches capillary, hairy at the insertion, at length spreading, the lower ones often whorled, 3—5-together; pedicells capillary, as long as the spikelets or longer; spikelets linear, 3—5 mm long, 0.7—1 mm broad, 5—11-flowered, purplish; flowering glume minute, oblong, acutish, with nerves slightly prominent. — Flow. April to June. —

N. d. Fûa, in fields; Mehallet-el-Kebîr; Tanta; Zifta; environs of Cairo, common. — **N. v.** Siut; Kene; Luksor in fields and on the margins of the desert; Aswân, not rare. — **O.** Oasis Dakhel; Tenîda, in gardens. — **D. a. mer.** Gebel Silsila.

Mediterranean region and also known from the Egyptian Sudan and others parts of tropical Africa.

138. (5.) **Eragrostis aegyptiaca** (Willd.) Delile Fl. d'Eg. (1813), p. 157 tab. IV, fig. 2. — Boiss. Fl. Or. V, p. 581. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 172 no. 1214. — *Poa aegyptiaca* Willd. Enum. Plant. Hort. Berol., p. 107. — Annual, tufted; culms geniculate-ascending or suberect, usually stout and branched below 15 to 25 cm high, glabrous, smooth, 3—4-noded, internodes more or less exserted; sheaths loose, strongly striate, keeled in the upper part, often glandular, particularly on the keel and the nerves above; glabrous or scantily hairy, bearded; ligule a fringe of short hairs; blades linear to lanceolate-linear, long tapering to a fine point, 5—8 cm long and more, 1—3 mm broad, flat, more or less flaccid, light green or subglaucous, glabrous or very scantily hairy, smooth below, scaberulous above, usually glandular along the margins; panicle pale, contracted, 5 cm long, 8 to 10 mm broad, linear-oblong, branches short, whorled, not ciliate at the base; spikelets sessile or subsessile, linear, acute, 5 mm long, 1 mm broad, imbricated over each other, 15—20-flowered, the axis flexuous;

lower glume oblong-lanceolate, obtusish, the lateral nerves prominent; upper glume curved. — Flow. April. —

N. d. Damanhur, not rare; Mansura; Tanta; Zifta, Zaqaziq; environs of Cairo, common. — **N. v.** Beni Suêf; Minia; Bu-el-Bershe; Siut; Esne; Edfu; Kene in gardens; Luksor, rare; Aswân; islands near Aswân; common. — **D. l.** Fields near the Pyramids of Giza. — **D. i.** Desert-el-Tih. —

Also known from Kordofan and Abyssinia.

139. (6.) **Eragrostis ciliaris** (L.) Link var. **arabica** (Jaub. et Spach) Aschers. et Schweinf. Ill. Fl. d'Eg., p. 172 no. 1215. — *Eragrostis ciliaris* β *brachystachya* Boiss. Fl. Or. V, p. 582. — *E. arabica* Jaub. et Spach Ill. Plant. Or. IV, p. 31. — Annual or subperennial (?), tufted; culms geniculate, ascending, often from a procumbent base, slender, 15 to 60 cm long, glabrous, smooth, simple or branched below, about 3-noded, internodes exerted; sheaths striate, tight, glabrous or scantily hairy, bearded with long hairs at the mouth; ligule a fringe of short hairs; blades linear, tapering to a fine point, 6—12 cm long, 2—3 mm broad, usually involute, somewhat stiff and spreading, glabrous, or with scattered fine long hairs, scaberulous; panicle spike-like, more or less lobed or interrupted, dense to very dense, 4—12 cm long; axis scabrid; branches adpressed, usually all very short or the lowest up to 2 cm long, divided from the base; pedicels very short; spikelets crowded, ovate, strongly compressed, 2 to almost 4 mm long, loosely 6—12-flowered, pallid, sometimes purplish; rachilla breaking up; glumes oblong-lanceolate, acute, 0.5 to almost 1 mm long, 1-nerved, keel scabrid; flowering glumes oblong in profile, subtruncate and mucronulate, spreading, about 0.5 mm long, thin, lateral nerves prominent, keel scabrid; pales equal to the glumes and falling with them, keels of the pale very long and rigidly ciliate; anthers 0.5—1 mm long; grain elongate-ovoid, 0.5 mm long, brown. — Flow. April to May. —

D. a. mer. Wady Tundeba; Wady Etit near the Red-Sea coast.

Also known from Nubia.

140. (7.) **Eragrostis bipinnata** (L.) Muschler in Flora von el-Tôr in Verhdlg. Bot. Ver. Prov. Brdgb. IL (1907), p. 74. — *Eragrostis cynosuroides* (Retz.) Roem. et. Schult. Syst. veget. II (1817), p. 577. — Boiss. Fl. Or. V, p. 583. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 172 no. 1216. — *Poa cynosuroides* Retz. Obs. bot. IV, p. 20. — Delile Fl. aeg. illustr., p. 22 tab. X, fig. 3. — *Cynosurus durus* Forsk. Flor. aeg.-arab., p. 21. — *Briza bipinnata* L. Syst. Veg. ed X (1759), p. 875. — Perennial, compactly caespitose; culms firm, erect, stout 30 to 90 cm high, glabrous, smooth, about 3-noded, upper

internodes exerted; ligule a minutely ciliate rim; blades narrow, linear, often pungent, filiform-convolute, tapering to a fine point, 6—24 cm long, 5—8—10 mm broad, light green or yellowish; glabrous; panicle cylindrical, 25—30 cm long, spike-like-bipinnate, flattened; spikelets linear, strongly laterally compressed, closely imbricate, alternate, sessile or subsessile on, and falling entire from, the slender rhachis of secund more or less distinctly 2-ranked spikes which are crowded into long narrow spike-like panicles; hachilla tough. Flowers numerous, bisexual, rather loose. Empty glumes very unequal, membranous, 1-nerved, keeled. Flowering glumes ovate, acute or subacute, entire, muticous, rigidly membranous, 3-nerved, acutely keeled, glabrous, side-nerves evanescent upwards. Pales slightly shorter than the glumes, 2-keeled. Lodicules 2, rather large, asymmetric, hyaline, nerved at the base. Stamens 3. Ovary glabrous; styles distinct, slender; stigmas plumose, laterally exerted. Grain loosely enclosed by the scarcely altered glume and pale, obliquely ovoid, obtusely triquetrous; pericarp thin, adnate to the seed; embryo about $\frac{1}{3}$ the length of the grain; hilum small, basal, punctiform. — Flow. December to March. —

N. d. Menzale; Environs of Cairo, everywhere in sandy places; Damanhûr, not rare; Zaqaziq, common; Fua; Tanta; Damanhûr; Benha-el-'Asl. — **N. f.** Medinet-el-Fayûm; Senhûr, not rare; Tomia, sandy places; Abûxa, rare; Begig, common. — **N. v.** Minia, banks of the Nile; Behianè. — Siut; el Homra; Abû-Foda, banks of the Nile; Kene, sandy places; Aswân. — **O.** Siwa; Little Oasis; Farâfra; Dakhel; Great Oasis: el-Kharge, 'Ain Taul; Qasr-el-Goêta; Qurqar. — **D. l.** Wady Natrun; Pyramids of Giza, in deep sand; Pyramids of Dahshûr; El-Kafr in sandy places, common; Rayân. — **D. a. sept.** Wady Dugla, Wady-Turra, Wady Rished near Helwan, common in sandy places. — **D. i.** Sâlihîya. —

Local name: qash; ambarfe; hamarte; generally: halfâ.

Also known from Egypt to India, and southwards to East Tropical Africa.

Stapf (Flora Cap. VII, p. 632) has separated this species generically as *Desmostachya* from *Eragrostis*, where it represented a separate section, *Desmostachya* in Hook. fil. Fl. Brit. Ind. VII. p. 324. *Desmostachya bipinnata* Stapf (l. c.) was originally described as *Uniola bipinnata* by Linnaeus. Subsequently, it has been redescribed in, or referred to, at least 5 other genera, viz. *Poa*, *Briza*, *Cynosurus*, *Eragrostis* and *Leptochloa*.

141. (8.) **Eragrostis nutans** (Retz.) Roxb. Fl. Ind. (1820), p. 337. — Boiss. Fl. Or. V, p. 583. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 172 no. 1217. — *Poa nutans* Retz. Observ. bot. IV, p. 19. — Densely tufted, 15—60 cm high; sheaths without a tuft of hairs at the throat; upper 4—6 cm long; blade narrow linear, glabrous, 6—8 cm

long. Panicle narrow, 15—30 cm long, with numerous short branches in distant ascending fascicles; pedicels usually very short; spikelets oblong, 0.75 cm long, 8—12-flowered. Flowering glume erecto-patent, oblong, obtuse, 0.5 mm long, glabrous, like the pale, on the back and edges or the pale indistinctly ciliated. — Flow. April. —

N. v. Siut; Kene; Gurna; Aswân, rare.

Also known from the Upper Nile region.

142. (9.) **Eragrostis coelachyrum** Benth. in Hook. Icon. XIV (1881), p. 50 tab. 1368. — Boiss. Fl. Or. V, p. 584. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 173 no. 1218. — *Coelachyrum brevifolium* Nees in Linnaea XVI, p. 221. — Annual, tufted; culms fascicled, geniculate-ascending 8—12 cm long, glabrous, smooth or somewhat rough, simple or with few leafy branches from the intermediate nodes; sheaths tight, bearded at the nodes and mouth, otherwise glabrous; ligule a short ciliate rim; blades lanceolate to ovate-lanceolate, acute, 3—5 cm long, 8—10 mm broad, slight-green or subglaucous; panicle loose; spikelets distichous, subsessile, 3—4-flowered; glumes ovate, obtuse, prominently 3-nerved; grain elliptic, slightly compressed from the back; brown pericarp slightly swelling in water. — Flow. February to March. —

D. a. mer. Wady Etit.

Also known from Nubia.

67. (50.) **Aeluropus** Trin.

Spikelets nearly sessile, 4—11-flowered, imbricated-clustered, the clusters forming an ovate-globular or oblong to linear-spike or head. Flowers perfect, the uppermost tabescent. Rhachis somewhat bristly, at length separating into joints. Glumes 2, unequal, shorter than the flowers, keeled, ovate-oblong, muticous or mucronate. Flowering glume herbaceous, keeled, or convex at the back, many-nerved, mucronate or somewhat awned. Pale obtuse, 2-keeled. — Low much branched rigid leafy perennial grasses. Leaves distichous, usually spreading and convolute, rigid and pungent, rarely flat. —

Species few, in the Mediterranean region, Orient and India.

A. Panicle oblong-cylindrical; leaves pungent, lanceolate or linear-lanceolate villous, stolons slender. 1. **A. repens**.

B. Panicle globose or ovate; leaves rigid, linear, acicular, glabrous; stolons rigid 2. **A. arabicus**.

143. (1.) **Aeluropus repens** (Desf.) Parl. Flor. Ital. I (1848), p. 462. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 173 no. 1219. — *A. littoralis* 3

repens Coss. in Coss. et Dur. Expl. scient. Algér. II, p. 155. — Boiss. Fl. Or. V, p. 591. — *Dactylis repens* Desf. Flor. Atl. I. p. 79 tab. XV. — *Aeluropus villosus* Trin. Fund. Agrost., p. 143. — Culms procumbent, stoloniferous, sometimes hispidulous, rooting at the joints, branching at the nodes, leafy to the tip, usually light-greenish-tomentellous, 5 to 30 cm long. Leaves glaucous, distichous, rigid, somewhat ascending, lanceolate to linear-lanceolate, acuminate 1.5—3 cm long, at length sometimes convolute-subulate. Spike oblong to cylindrical, at first 5—13 mm long, at length evolved and interrupted, 3 to 4 cm long; clusters nearly sessile; spikelets 4—7-flowered, subglabrous; glumes oblong, obtuse, densely hirsute; lower glume oblong-lanceolate, obtuse or abruptly acuminate, mucronate. — Flow. December to March. —

M. ma. Mariut-Mergheb in sandy places, common; Mandara, Alexandria, Ramle, common; Abukir. — **M. p.** Rosetta, everywhere in deep sand; Damietta, in sandy localities common; Port Said. — **N. f.** El-Edwa, margins of sandy places; El-Wâdy, in deep sand; El-Hammâm, not common. — **N. v.** Cairo: Deyr-et-Tin; Suâdi near Minia, not common; Abu Gurge, rare; San. — **O.** Little Oasis; Farâfrah; Dakhel. Great Oasis: Mex-el-Bakhari, common; 'Ain Abdallah Khasheyf, not rare. — **D. i.** Ismailia; Bîr-Abu-Balah. — **Es-Sâlihiya**, margins of the desert, common. — **D. a. sept.** Suez, in sandy places near the gulf, common. Ayûn-Mûsa. — Petrified forest near Cairo; Helwan in the desert along the carriage, road to the Nile; Wady Abû Shusha; New springs near Helwan; English Tomb, Fullers Valley, Dinkler Hill near Helwan.

Local name: negîl (Ascherson, Muschler) uegîl-el-sheytâny; mulleyh; negîl beledy; 'akrish (Ascherson).

Mediterranean Region.

144. (2.) **Aeluropus arabicus** Steud. Nomencl. bot. ed. II, vol. I (1840), p. 30. — *Poa massavensis* Fres. in Mus. Senkberg. II (1837), p. 143. — *Aeluropus brevifolius* Wall. Cat. no. 8897. — *Aeluropus mucronatus* Aschers. in Schweinf. Beitr. z. Flor. Aethiop., p. 297 no. 3374. — Boiss. Fl. Or. V, p. 595 — and many other synonyma. — A rigid perennial herb, with long wiry roots. Stems 12 to 30 cm long, densely tufted, branched, very hard, smooth, erect or prostrate with long often creeping stolons, base slightly swollen, clothed with rigid, glabrous or hairy sheathing scales, above clothed with leaves, and terminating in a naked glabrous or pubescent slender peduncle, 2 to 6 cm long. Leaves 1 to 3 cm long, erect or spreading and recurved, subulate-lanceolate, or acicular, coriaceous, pungent, convolute, rarely flat, striated with close-set nerves, base rounded, glabrous, midrib obscure, margins smooth or scaberulous; sheaths

short, terete, inflated or dilated, glabrous or ciliate, ligule a ridge of short hairs. Heads 1 to 2 cm in diameter, globose, ovoid or oblong. Spikelets 3 to 5 mm long, 4-many-flowered, crowded, sessile, villous with soft hairs; glume green or white; glumes closely imbricate, ovate-oblong, apiculate, concave, margins hyaline, nerves strong; flowering glumes rather longer than the empty glumes, many-nerved, lower 2—4 sometimes neuter, palea broadly truncate or 3-lobed, keels villous. Ovary obovoid. Grain obovate-oblong, compressed dorsally. — Flow. January to May.

R. Qoseyr, not rare; Sherm Luliya; Wady Gemâl. —

Local name: negil hanganeym (Klunzinger).

Also known from Sinai and the other parts of Arabia.

68. (51.) *Dactylis* Linn.

Spikelets much laterally compressed, very shortly pedicelled in dense compound often secund clusters of a panicle or a false spike; rhachilla very tardily disarticulating above the empty glumes and between the flowering glumes or quite tough. Flowers 3—7, bisexual, or the uppermost rudimentary, exserted from the glumes. Glumes rigid, more or less hyaline, strongly keeled, subequal or the lower shorter, 1—3-nerved. Flowering glumes oblong, rigid, subherbaceous, mucronate or shortly awned, 5-nerved, keeled, keel ciliate; callus 0 or obscure. Pales slightly shorter than the glumes, 2-keeled. Lodicules 2, bilobed. Stamens 3. Ovary glabrous; styles distinct; stigmas plumose, laterally exserted. Grain enclosed by the glume and pale, oblong, strongly convex on the back, grooved in front, somewhat soft; embryo rather small; hilum punctiform, basal. Perennial, of varying habit; blades flat; ligules scarious; clusters of spikelets compact in an interrupted or uninterrupted false spike, or at the end of the branches or branchlets of a panicle.

Species about 3 (or 1, very polymorphic) in the temperate regions of the Old World; introduced elsewhere.

145. *Dactylis glomerata* L. var. *hispanica* (Roth) Koch Syn. ed. 1 (1837), p. 808. *Dactylis hispanica* Roth Cat. Bot. I, p. 8. — *D. cylindracea* Brot. Flor. Lus. I, p. 99. — Tufted: rhizome short, oblique; culms shortly ascending, geniculate or erect, rather robust, 1 to several feet high, simple, glabrous, smooth or slightly rough below the panicle, 2—3-noded: internodes more or less exserted; leaves mostly crowded at the base, glabrous; sheaths tight, striate, lower more or less compressed and keeled (particularly those of the innovation shoots), pallid, subpersistent or breaking up into fibres, upper terete, rough or almost smooth; ligules oblong, acute, up to

6 mm long; blades linear, tapering to an acute point, 10--30 cm long or longer, $2\frac{1}{2}$ —8 mm broad, flat, flaccid, rough on the upper side and along the margins, striate; panicle erect, 2 cm to more than 15 cm long; clusters crowded into a dense (usually lobed) terminal false spike with or without 1—4 (rarely more) distant branches below it; these erect or spreading, straight or flexuous, terminated by similar clusters or groups of clusters; axis, branches and branchlets scabrid or pubescent in the upper part, the latter often minutely hispid or ciliate; spikelets oblong, $2\frac{1}{2}$ —8 mm long, light green, often concave on the inner side; glumes 2—4 mm long, glabrous to pubescent; flowering glumes about $5\frac{1}{2}$ mm long, tips obtuse, sides scaberulous to pubescent. mucro or awn up to 2 mm long; keels of pales ciliate; anthers $1\frac{1}{4}$ — $2\frac{1}{2}$ mm long; grain 2— $2\frac{1}{4}$ mm long. — Flow. April.

M. ma. Râs-el-kenû'is; Alexandria; Montaza; Mex, common. The typical form has been collected by Dr. Pfund at Tâkh (N. d.). Throughout the Mediterranean region.

69. (52.) *Schismus* P. Beauv.

Spikelets laterally compressed, paniced: rhachilla disarticulating above the empty glumes and between the flowering glumes. slender, glabrous. Flowers 5—7, bisexual, the uppermost reduced. Empty glumes much longer than the single flowering glumes, acute, herbaceous on the back, with white subhyaline margins, subequal, the lower broader, 5—7-nerved, the upper 3—5-nerved. Flowering glumes obliquely obovate to oblanceolate in profile, 2-lobed or 2-fid, with or without a mucro or a minute awn from the sinus, thin, hairy below, rounded on the back; nerves 7—9, prominent, the lateral evanescent and obscurely anastomosing below the hyaline tips; callus small. Pales spathulate, 2-keeled below the broad top, longer or shorter than the glumes. Lodicules 2, cuneate, nerved, ciliate. Stamens 3. Ovary subglobose, glabrous; styles distinct, slender, about as long as the narrowly and densely plumose laterally exerted stigmas. Grain loosely embraced by the unaltered glume and pale, oblong to obovate, trigonous to plano-convex; hilum small, elliptic, basal; embryo less than $\frac{1}{2}$ the length of the grain. — Annual, very rarely subperennial, rather small; blades very narrow, often subsetaceous; ligule reduced to a line of hairs; panicle contracted, or at least narrow; spikelets conspicuously nerved, only the upper flowers exerted from the glumes.

Species about 4; in the Mediterranean Region from the Canaries to India, and in South Africa.

- A. Lower glume short-hairy at the margin or all over the back, rarely glabrous, bifid, to one fifth of its length, lobes obtuse 1. *S. calycinus*.
 B. Lower glume silky hirsute, bifid to one-third or one-half its length, lobes acute 2. *S. arabicus*.

146. (1.) **Schismus calycinus** (Loefl.) Coss. in Coss. et Dur. Expl. scient. Algér. II (1854—1867), p. 138. — Boiss. Fl. Or. V, p. 597. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 173 no. 1222. — *Festuca calycina* Loefl. It. Hisp., p. 116. — Annual, tufted; culms often very numerous, geniculately ascending, 2—18 cm long, very slender, smooth, 2-noded, internodes enclosed or exserted; leaves glabrous or very sparingly hairy, often equalling or overtopping the culms; lowermost sheaths scarious, pallid, prominently few-nerved, the upper very tight, all bearded at the mouth; ligule a ciliate rim; blades very narrow, linear, acute, 2—6 cm long, up to 1 mm broad, flat or setaceously convolute, filiform, flaccid or somewhat rigid and curved, scaberulous or smooth; panicle contracted, oblong, 10—20 mm long, 4—14 mm broad, dense, sometimes much reduced; spikelets narrow, $4\frac{1}{2}$ — $6\frac{1}{2}$ mm long, greenish, 6—8-flowered; glumes with rather broad and marked white margins, the lower oblong-lanceolate, acute, 5—7-nerved, $1\frac{1}{2}$ —4 mm long, the upper lanceolate, acute to subacuminate, 3—5-nerved, slightly longer; flowering glumes obliquely obovate-oblong in profile, 1 — $2\frac{1}{8}$ mm long, shortly and subobtusely 2-lobed, minutely mucronate or emucronate, densely hairy all over below the broad hyaline tip or subglabrous except at the sides; lower pales exceeding their glumes; anthers 1 — $1\frac{1}{2}$ mm long; grain globose-obovoid to obovoid, 1 mm long. — Flow. January to March.

M. p. Rosetta. — **D. l.** Pyramids of Gîza, Saqqâra and Dahshûr. — **D. i.** Ismailia, everywhere in sandy places. — **D. i.** Es-Sâlihiya. — **D. a. sept.** Gebel ahmar; Abassiya, Qûbba; Great Petrified Forest; Wady-Rished, Wady-Hof, Wady Dugla near Helwan. — **D. a. mer.** Qoseyr common in sandy places.

Throughout the Mediterranean region from the Canaries to Persia.

147. (2.) **Schismus arabicus** Nees, Fl. Afr. austr. (1841), p. 422. — Boiss. Fl. Or. V, p. 597. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 173 no. 1223. — Annual, densely tufted; culms often very numerous, geniculately ascending 4—15 cm long, very slender, smooth, 2—3-noded, internodes enclosed or exserted; leaves glabrous or very sparingly hairy, often equalling or overtopping the culms; lowermost sheaths scarious, pallid, prominently few-nerved, the upper very tight, all bearded at the mouth; ligule a ciliate rim; blades very narrow, linear, acute, 2—4 cm long, 1—2 mm broad, flat or setaceously convolute, filiform, flaccid or somewhat rigid and curved,

scaberulous or smooth; panicle contracted, oblong, 1—1.5 cm long, 3—5 mm broad, dense, sometimes much reduced; spikelets narrow, $4\frac{1}{2}$ —5 mm long, greenish, 6—8-flowered; pedicels one half to one-fourth as long as the spikelets; glumes acuminate; lower pale silky hirsute, bifid to one-third or one-half its length, lobes acute; awn obsolete; upper glume two-thirds as long as the lower. — Flow. March to April.

M. ma. Alexandria. Mex, Mariut-Mergheb, everywhere on calcarious ground; Ramle, in sandy places. — **M. p.** Rosetta, margins of the desert, not rare; Damietta, in sandy places common, in fields rare; Qatiye; El-Arish. — **O.** Little Oasis, not common: Great Oasis: 'Ain Dakhkhin; Mansuf, in sandy places. — **D. l.** Mena House near Cairo; along the Pyramids of Giza; Pyramids of Zâwiyet-el'Aryân. — **D. i.** Es-Sâlihiya, not common; Ismailia, in sandy places; Suez, common on calcarious ground. — **D. a. sept.** Cairo: Abassiya; Mokattam; Gebel ahmar; Wady Hamata; Southern Galala; Upper Wady Dugla; Wady Hof, Wady Rished, Osman Galeb Valley, Wady et-Tê'm near Helwan, everywhere. — **D. a. mer.** Qoseyr, not rare.

Local name: abû-makhy; khafûr; zerz'-el-fâr.

Also known from Sinai, Syria and Palestine.

70. (53.) **Poa** Linn.

Spikelets mostly 2—6-flowered, in loose or close (rarely in spike-like) panicles; rachilla disarticulating above the empty glumes and between the flowering glumes, glabrous or scantily and minutely hairy; flowers bisexual or the upper imperfect. Empty glumes thin, membranous, keeled, acute or obtuse, 1—3-nerved. Flowering glumes membranous, sometimes rather firm, obtuse or acute, 5—7-nerved; callus small, obtuse, often with a tuft of long wool. Pales shorter than the glumes, 2-keeled. Lodicules 2, more or less 2-lobed. Stamens 3. Ovary glabrous, styles short, free; stigmas plumose, laterally exerted. Grain ovoid, oblong or linear, often grooved, free or adherent to the pale; hilum punctiform, basal; embryo small. — Annual or perennial; blades flat and flaccid or convolute and more or less rigid; ligules hyaline; panicles open, often effuse, rarely contracted, spike-like; spikelets rather small, awnless.

Numerous species in the temperate regions, particularly of the northern hemisphere, few in the tropics.

A. Annual plants; lateral nerves of the lower glume prominent; spikelets 3—5-flowered 1. **P. annua.**

B. Perennial plants; lateral nerves of the lower glume obsolete; spikelets 5—6-flowered 2. **P. sinaica.**

148. (1.) **Poa annua** L. Spec. Plant. I (1753), p. 96. — Boiss. Fl. Or. V, p. 601. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 173 no. 1224. — Sickenberg. Contrib. Fl. d'Eg., p. 310. — Annual or subperennial, tufted, glabrous; culms erect from a geniculate and often rooting base, from a few cm to 35 cm long, slightly compressed below, smooth; internodes exserted or enclosed; sheaths rather loose, slightly compressed, smooth; ligules oblong to ovate, up to $2\frac{1}{2}$ cm broad; blades linear, acute, $1-2\frac{1}{2}$ cm (rarely longer) by $1-2\frac{1}{2}$ mm, flat flaccid; margins scaberulous; panicle rather stiff, ovate, loose, up to $6\frac{1}{2}$ cm long, often secund; the lower branches 2- (rarely 3-5-) nate or solitary, spreading, ultimately often deflexed, up to $2\frac{2}{3}$ cm long, branched from the middle, smooth; spikelets more or less crowded, oblong-ovate or ovate, green or sometimes purplish, $2-4\frac{1}{2}$ mm long, 3-7-flowered; lower glume lanceolate, acute, $2-3\frac{1}{2}$ cm long, 1-nerved to sub-3-nerved, upper slightly longer, ovate when expanded, 3-nerved; flowering glumes oblong, obtuse or subacute, $2\frac{1}{2}$ mm long; margins and tips broadly hyaline; nerves slightly prominent, silkily ciliate below along the keel and the outer lateral nerves, rarely glabrescent, without connecting wool; pales slightly shorter than the flowering glumes, keels ciliate; anthers 1 mm long; grain oblong, 1-2 mm long. — Flow. April.

M. ma. Alexandria, Montaza. — **M. p.** Rosetta, in fields, not common. — **N. d.** Cairo, in fields and gardens.

Throughout Europe and temperate Asia, introduced into most other temperate regions, rare in the tropics.

149. (2.) **Poa sinaica** Steud. var. **aegyptiaca** Schweinf. in Sickenberg. Contrib. Flor. d'Eg. (1901), p. 310. — Perennial, tufted; 20-30 cm high; root fibrous; culms erect, densely tufted, often bulbous at the base. Leaves linear-setaceous or convolute, tapering to a fine point, 5-8 cm long, 1 or 2 mm broad; panicle rather stiff, oblong, 2 to 5 cm long, 1 cm broad, compact, branches short, 2-3 together; spikelets crowded, ovate-oblong, 3-4 mm long, 1-2 mm broad, white, glossy; flowers 5-6, slightly or not at all connected by fleece; glumes nearly equal, ovate-oblong, acute, with glabrous keel, never scabrous; lower glume oblong, acutish, more or less pruinose-scabrous; pales with dense ciliate nerves, 1-2 mm long, 1 mm broad; grain oblong, 1 mm long. — Flow. March. —

D. a. sept. Upper Wady Ruthi (northern Galala - Schweinfurth no. 278). — Southern Galala; Wady Tin; Wady Azkar. —

The variety differs from the typical form by the glumes with glabrous back and the flowering glumes with dense ciliate nerves.

71. (54.) *Festuca* Linn.(§ *Vulpia*.)

Spikelets laterally compressed after flowering, on short clavate pedicels in usually more or less secund and spike-or raceme-like panicles; rachilla slender, disarticulating above the empty glumes and between the fertile glumes. Flowers 5—7, long exserted from the glumes bisexual, except the reduced upper ones, or the lowest bisexual and the rest reduced to empty glumes. Empty glumes very unequal, lower very minute or obsolete, or like the upper subulate to subulate-lanceolate, but much shorter, 1- (or the upper 3-) nerved. Flowering glumes subulate-lanceolate, passing into an awn, rounded on the back, faintly 5-nerved; awn straight, often long; callus small, obtusely glabrous. Pales 2-keeled, entire or minutely 2-toothed. Lodicules 2, hyaline, unequally lobed. Stamens 1—3; filaments very short; anthers usually enclosed in the flower during flowering or permanently. Ovary glabrous (in the Egyptian species) or minutely hispid at the top; stigmas sessile, plumose, permanently enclosed in the flower, or shortly exserted at the base. Grain linear, strongly compressed from the back, concave in front, more or less adhering to the pale or also to the glume; embryo small; hilum filiform, long. — Annual or perennial, slender grasses; blades linear, very narrow, usually convolute or involute, at least when dry; panicles contracted, narrow, usually more or less secund, with short clavate pedicels; spikelets subcylindric and acuminate, when young, then opening out, laterally compressed and broader upwards; flowers often cleistogamous.

Numerous species, often very difficult to discriminate, in the temperate regions, particularly of the northern hemisphere, and a few in the high mountains of the tropics.

A. Spikelets pedicelled.

I. Pedicels thickened above; fertile flowers usually numerous in the spikelet; glumes unequal; lower glume long-aristate. Grain tapering at both ends.

a) Upper leaves often near the panicle and sometimes forming an involucre to it. . . . 1. *F. uniglumis*.

b) Uppermost leaves remote from the panicle 2. *F. dertonensis*.

II. Pedicels thickened above; the lowest flower of the spikelet only fertile, the rest reduced to glumes gradually less in size, in 2-ranks or spirally crowded in a stipitate cluster. All the lower glumes long-aristate. Grain rounded at the tip 3. *F. brevis*.

B. Spikelets subsessile, on node-like pedicells, the fertile flowers numerous. Glumes very unequal, the lower one often obsolete. Grain tapering at both ends 4. **F. pectinella.**

150. (1.) **Festuca uniglumis** Sol. in Ait. Hort. Kew. ed. 1, I (1789), p. 108. — *Vulpia uniglumis* Dum. Agrost. Belg. (1823), p. 100. — Boiss. Fl. Or. V, p. 629. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 173 no. 1226. — Sickenberg. Contrib. Fl. d'Eg., p. 310. — *Festuca bromoides* L. Spec. Plant. I, p. 75. — Upper leaves often near the panicle, and sometimes forming an involucre to it. Panicle oblong, 5—8 cm long, 1—2 cm broad, one-sided, nearly simple, branches short, stiff; pedicels rather long, compressed, thickened from the base to the tip; spikelets 4—7-flowered; lower glume minute or 0, upper one nearly as long as the adjacent glume, long-awned; flowering glume linear-lanceolate, glabrous at the back, scabrous at the keel and margins and tip, ending in a scabrous awn as long or longer than itself. — Flow. March to April.

M. ma. Alexandria, Mex in sandy places not rare; Ramle; Mandara; Abukîr, common in sandy places. — **M. p.** Rosetta, in sandy fields near Abu Mandur; Brullus; Bir Mazan; El-Grady.

Europe, Mediterranean region.

151. (2.) **Festuca dertonensis** Aschers. and Graebner Synops. mitteleurop. Flor. II, 1 (1898—1902), p. 559. — *Bromus dertonensis* All. Fl. Pedem. II (1785), p. 249. — *Vulpia sciurioides* Gmel. Fl. Bad. I, p. 8. — *Vulpia dertonensis* Durand-Barratte Flor. Libyc. Prodrom., p. 269 no. 981. — Annual, tufted; culms geniculate, ascending or suberect, very slender, 15—45 cm high, glabrous, smooth, 2—3-noded, uppermost internode usually occupying more than $\frac{1}{2}$ of the culm, long exserted; sheaths somewhat loose, glabrous, smooth; ligules extremely short; blades linear tapering to a very acute point 2 to more than 12 cm long, 1—2 mm broad, flat or involute or convolute when dry, flaccid to subrigid, finely and prominently few-nerved, scabrid to puberulous on the upper surface, otherwise glabrous and smooth; panicle erect or nodding and flexuous, very narrow, more or less secund, 2—6 cm long, rarely longer, sometimes reduced to a raceme; rhachis filiform, acutely triquetrous like the branches, scabrid along the angles or smooth below; branches fascicled, 2-nate or solitary, racemose or the lowest a gain divided below, uppermost or sometimes all reduced to a single spikelet, erect or nodding; lateral pedicels about 2 mm long, smooth or almost so; spikelets 8—12 mm long, exclusive the awns, loosely 4—7-flowered; empty glumes subulate-lanceolate, acute or acuminate, lower one 2—4 mm long, 1-nerved, upper one 4—8 mm long, strongly

3-nerved; flowering glumes lanceolate-linear, acuminate in profile, 4—8 mm long, faintly 5-nerved, scaberulous at least above; awns as long as the flowering glume or longer, up to 12 mm long, very fine; stamen 1; anthers about 1 mm long; grain about 5—6 mm long. — Flow. April.

M. ma. Mariut, on calcareous ground, not rare.

Also known from Europe, North Africa and Asia.

152. (3.) **Festuca brevis** (Boiss. et Kotschy) Aschers.-Schweinf.-Muschler comb. nov. — *Festuca inops* Delile Flor. Aeg. Ill., p. 52 no. 110 nomen nudum. — *Vulpia inops* Hackel in Flora (1880), p. 467. — Boiss. Fl. Or. V, p. 630. — *Vulpia brevis* Boiss. et Kotschy Diagn. Ser. II, 4, p. 139. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 173 no. 1227. — Sickenberg. Contrib. Fl. d'Eg., p. 310. — Annual, densely tufted; culms geniculate-ascending or usually erect, very slender 15 to 30 cm high, glabrous, smooth 2—3-noded; sheaths somewhat loose, glabrous, smooth; ligules very short; blades linear, tapering to a fine point 2—6 cm long, 1—3 mm broad, flaccid, finely and prominently few-nerved, scabrid; panicle ovate to oblong, 3—5 cm long, 6—15 mm broad, very dense; branches short, thick; pedicels short, flattened; glumes equal in length, glabrous or hirsute, the lower subulate, the upper linear-lanceolate, both ending in a long awn; lower glume of fertile flower glabrous or hirsute, its awn with those of the glumes overtopping the awns of the sterile flowers, upper flowers of sterile cluster reduced to awns.

— — **Festuca inops** var. **subdisticha** (Aschers. and Hackel) Aschers.-Schweinf.-Muschler. — *Festuca inops* Del. var. *subdisticha* Aschers. and Hackel in Verhdlg. Bot. Ver. Prov. Brandbg. XXII (1880), p. 113. — *Vulpia brevis* var. *subdisticha* Aschers.-Schweinf. Ill. Fl. d'Eg., p. 173 no. 1227. — Flowers with distichous disposed glumes. — Flow. March to April.

M. ma. Matruqa; Alexandria, not rare; Mariut-Bringhi very common on calcareous ground. — **M. p.** Rosetta; Bir-Abu-Mezru.

— — var. **spiralis** (Aschers. and Hackel) Aschers.-Schweinf.-Muschler comb. nov. — *Festuca inops* Delile var. *spiralis* Aschers. and Hackel in Verhdlg. Bot. Ver. Prov. Brandbg. XXII (1880), p. 173. — *Vulpia brevis* var. *spiralis* Aschers.-Schweinf. Ill. Fl. d'Eg., p. 173 no. 1227. — Flowers with spirally disposed glumes.

M. ma. Alexandria, not rare between the other variety.

The species is also known from Cyrenaica, Sinai and Syria.

153. (4.) **Festuca pectinella** Delile Ind. sem. hort. Monspel. (1836), p. 24. — *Vulpia pectinella* Boiss. Fl. Or. V (1884), p. 631. —

Aschers.-Schweinf. Ill. Fl. d'Eg., p. 174 no. 1228. — *Festuca cynosuroides* Delile (non Desf.) Fl. Aeg. Ill., p. 52. — Annual, tufted; culms ascending or suberect; 5—30 cm high, glabrous, smooth 2- sometimes 3-noded, uppermost internode 3—5 cm long; sheaths rather loose, smooth, glabrous; ligules very short; blades linear, tapering to a fine point, 2—6 cm long, 0.5—1 mm broad, flat or involute or convolute when dry, flaccid to subrigid, finely and prominently few-nerved, scabrid to puberulous on the upper surface, otherwise glabrous and smooth; panicle spike-like. 2—3 cm long, 8 mm broad, one-sided, simple or with one or two spreading branches at the base; spikelets 2-ranked, spreading; oblong, 4 to 6 mm long, 2 mm broad, 3—8-flowered; lower glume minute, scale-like, ovate-triangular, upper coriaceous, concave, linear, mucronate, convex at the back, half as long as the adjacent flower; flowers usually loosely racemed along the scarcely thickened axis; flowering glume coriaceous, linear, involute, scarcely keeled, tapering into an awn-like mucro. — Flow. March.

M. ma. Alexandria, Mex on sandy hills. — **M. p.** Katīyeh; Bir Abu Elfeyn; Bir-el-abd; Bir-Mazâr; Tauil-es-sakham; Plain between Gebel Ekhfeyn and Gebel Nebli Gehâm. — **D. i.** Between Ismailia and Bir-Abu-Dafn.

Also known from Algeria, Sinai, Syria and Palestine.

72. (55.) *Scleropoa* Griseb.

Spikelets narrow, laterally compressed or almost cylindric when closed, in stiff panicles; rachilla very tardily disarticulating above the empty glumes and between the flowering glumes. Flowers few to many, bisexual, uppermost reduced, long exserted from the glumes. Empty glumes more or less unequal, herbaceous, oblong, acute or obtuse, 1—3-nerved, stoutly keeled, persistent. Flowering glumes oblong, obtuse, rounded on the back or slightly keeled, firm, herbaceous except at the very tips, 5-nerved; outer lateral nerves more distinct than the faint inner; callus obscure. Pales almost as long as the glumes, 2-keeled. Lodicules 2, ovate, hyaline. Stamens 3. Ovary glabrous; styles distinct, very short; stigmas laterally exserted, plumose. Grain very tightly embraced by the hardened glume and pale, oblong, almost semiterete, subconcave in front with a small soft terminal cap; embryo small; hilum basal, punctiform. — Annual short grasses; blades linear, flat or involute; ligules hyaline; panicles short, very stiff, sometimes rather dense, with short, rigid, 2-ranked, more or less spreading branches; spikelets awnless.

Species 3, in the Mediterranean countries from the Canaries to Persia and in Western and Southern Central Europe.

- A. Spikelets broad, flattened; panicle somewhat 1-sided.
 I. 10 to 25 cm high; leaves short, the upper remote from the panicle 1. *S. philistaea*.
 II. 30 to 50 cm high; leaves linear, the upper sheathing the base of the panicle 2. *S. maritima*.
 B. Spikelets narrow, linear-oblong to linear.
 I. Panicle rigid; branches of the panicle not jointed; glumes obtuse 3. *S. rigida*.
 II. Panicle straggling; branches of the panicle jointed, glumes acute 4. *S. memphitica*.

154. (1.) ***Scleropoa philistaea*** Boiss. Diagnos. Sér. I, fasc. 13, p. 60. — var. *Rohlfiana* (Cosson) Aschers.-Schweinf. Primit. Flor. Marm. no. 362 in Bull. Herb. Boiss. I (1893), p. 676. — *Festuca Rohlfiana* Coss. in Bull. Soc. bot. Franc. 19, p. 83. — Annual, 10 to 30 cm high. Leaves linear, setaceous-acuminate, short, the upper remote from the panicle. Panicle oblong-elliptic, usually purplish 5 to 8 cm long, 3 to 4 cm broad, the lower branches with 3 to 5 spikelets; spikelets 6 to 10 mm long, 3 to 3 mm broad, oblong-elliptical, obtuse, 9 to 13-flowered, tapering at the base; glumes very densely imbricate, coriaceous, oblong, the lower shorter, 1-nerved, the upper 3-nerved; lower pale oblong, obtuse, hirtulous toward the base, lateral nerves obsolete. — Flow. March to April.

M. ma. Alexandria-West. Rare.

Also known from Tunisia, Tripolis and Cyrenaica.

155. (2.) ***Scleropoa maritima*** Parl. Flor. Ital. I (1848), p. 468. — *Triticum maritimum* L. Spec. Plant. I, p. 128. — *Festuca maritima* D. C. Flor. Franc. III, p. 47. — *Brachypodium maritimum* Roem. and Schult. Syst. Veg. ed. II, p. 743. — *Sclerochloa maritima* Link. Hort. Bot. Berol. II, p. 274. — *Festuca lanceolata* Forsk. Flor. aeg.-ar., p. 22. — Boiss. Flor. Or. V, p. 637. — Aschers.-Schweinf. III. Flor. d'Eg., p. 174 no. 1229. — Annual, 30 to 50 cm high, glaucous. Leaves rigid, narrow-linear, at the length convolute, the upper often sheathing the base of the panicle. Panicle oblong-ovate, 8 to 10 cm long, 4 to 5 cm broad, compound, branches thick, triquetrous, forked often with nearly sessile spikelets at the forks. Spikelets 5—9-flowered, oblong-linear, acute, 1 to 1.2 cm long, 1 to 2 mm broad; glumes oblong, keeled, the lower 3-nerved, shorter, the upper 5-nerved; lower pale coriaceous, oblong-lanceolate, obtusish, mucronulate, the lateral pair of the nerves close to one another and to the margin. — Flow. April to May.

M. ma. Alexandria West.

Also known from South Europa and the other parts of North Africa.

156. (3.) **Scleropoa rigida** Griseb. Spic. Flor. Rum. II (1844), p. 431. — Culms geniculate, ascending or suberect, from a few cm to 35 cm high, glabrous, smooth, 3—5-noded, internodes more or less exserted; leaves glabrous; sheaths tight, terete, thin, striate; ligules oblong, obtuse, up to 2—3 mm long; blades linear, acute 2—8 cm long, 2—3 mm broad, flat, scaberulous on the upper side, smooth below; panicle linear-oblong to ovate, rather dense, 2—6 cm long; rhachis and all the divisions of the panicle stiff, acutely triquetrous, scabrid to puberulous; branches solitary or 2-nate, alternate on the front of the rhachis, erect, then spreading, lowest 0.75 to 2 cm long (exclusive the terminal spikelet), straight, usually racemose, 2—10-spiculate with the spikelets much longer than the internodes and therefore apparently fascicled, more rarely repeatedly divided or reduced to a solitary spikelet; lateral pedicels short, stout; spikelets subcylindric with imbricate glumes when closed, or linear, flat, with spreading glumes when open, 4—12 mm long, 4—12-flowered; rhachilla scaberulous; glumes acutely keeled or rounded on the back, 1—2 mm long, lower slightly shorter, stoutly 1-nerved, upper 3-nerved, side-nerves usually faint; flowering glumes linear-oblong in profile, rounded on the back, 2—4 mm long, smooth, nerves fine, inner lateral-nerves faint, tips usually mucronulate; keels of pales scabrid; anthers 1 mm long. — Flow. March.

M. ma. Khingi-Mariut; Mariut-Mergheb. —

A native of South and Western Europe, North Africa and Western Asia.

157. (4.) **Scleropoa memphitica** Parl. Flor. Ital. I (1848), p. 468. — Boiss. Fl. Or. V, p. 639. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 174 no. 1230. — *Dactylis memphitica* Roth Cat. I, p. 18. — Culms geniculate, ascending or suberect, 10—20 cm long, glabrous, smooth, 3—5-noded, internodes more or less exserted; leaves glabrous; sheaths of leaves dilated, open, the uppermost often forming a spathe to the panicle; blades linear to linear-lanceolate, acute, 3—9 cm long, and often more, flat, scaberulous on the upper side, smooth below; panicle oblong, straggling, 5 or 8 to 10 cm long, 1—3 cm broad, forked; the spikelets at first erect, at length at angles from 60° to 130°, linear, acute at both ends, 7—10 mm long, 1—1.5 mm broad; glumes lanceolate, keeled, more or less unequal; lower glumes appressed, lanceolate, acute or acuminate, mucronate or aristulate, keeled, 3-nerved. — Flow. March to April.

M. ma. Matruqa; Mex; Alexandria, common in sandy places; everywhere near Mariut; Montaza; Ramle; Abukîr. — **M. p.** Rosetta, everywhere in sandy places common; Damietta in sandy places and in fields. El-Arish. — **O.** Little Oasis; Gardens at El-Qasr; Khenafes

in the Great Oasis; Dakhel, not rare. — **D. l.** Abusîr. — **D. i.** Eş-Sâlihiya, in sandy places, not rare; Ismailia, margins of fields and in deep sand; Wady-el-Arish. — **D. a. sept.** Wady Turra, Wady Hof, Wady Abu-shushah, Wadi Rished near Helwan. —

Also known from the other parts of Northern Africa and Syria.

— **dichotoma** (Parl.) Bonnet and Barratte Cat. Plant. Tunisie (1896), p. 483. — *Scleropoa dichotoma* Parl. Flor. Ital. I. p. 471. — Boiss. Fl. Or. V, p. 639. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 174 no. 1231. — *Festuca dichotoma* Forsk. Fl. Aeg.-arab., p. 22. — Culms smaller, slender, 5 cm long; flowers appressed; glumes acute (never acuminate-aristulate). —

M. ma. Matruqa; Mex; Alexandria, not common in sandy places; Montaza; Ramle in deep sand; Mariut not rare. — **M. p.** Rosetta; Damietta, on sandy hills.

Also observed in the others regions of North-Africa.

73. (56.) **Bromus** Linn.

Spikelets laterally compressed, at least after flowering, variously paniced; rachilla disarticulating above the empty glumes and between the flowering glumes. Flowers usually numerous, bisexual, the uppermost reduced. Empty glumes more or less unequal, acute to acuminate, persistent, lower one 1—7-, upper one 3—9-, nerved and sometimes mucronate or aristulate. Flowering glumes lanceolate or broadly oblong, rounded on the back or keeled, 5—13-nerved, usually awned; awn terminal (rarely 3 or 0) or somewhat distant from the often 2-toothed tip, straight or recurved and then often loosely twisted below, not kneed. Pales entire or bifid; keels usually rigidly ciliolate or ciliate. Lodicules 2, oblong or lanceolate, entire or lobed. Stamens 3, rarely 2. Ovary obovoid with an often large, villous, 3- or 2-lobed terminal appendage; styles short, lateral on the appendage; stigmas plumnose, laterally exerted, or in the cleistogamic species permanently enclosed. Grain linear to linear-oblong, convexo-concave and usually adherent to the glume and pale, or at least to the latter; hilum filiform, long; embryo small. Annual or perennial, of very varying habit; blades linear, flat, often flaccid; ligules membranous, hyaline; panicle contracted, often very dense, or open and even effuse, or reduced to a raceme; spikelets rather large, erect or pendulous, from ovoid to linear-oblong or linear-cuneate; awns very long or short, sometimes reduced to a mucro or 0.

Species rather numerous, mostly in the temperate regions of the northern hemisphere and of South America, several in the high mountains of the tropics.

- A. Glumes unequal; spikelets after flowering broader at the tip.
 - I. Spikelets 6—8 cm long; glumes less than half as long as the awn 1. *B. villosus*.
 - II. Spikelets 3—4 cm long; glumes about as long as the awns.
 - a) Spikelets pendulous 2. *B. tectorum*.
 - b) Spikelets erect.
 - 1. Lower glumes with prominent nerves.
 - α) Awn erect 3. *B. matritensis*.
 - β) Awn curved outwards 4. *B. rubens*.
 - 2. Lower glumes with obsolete nerves 5. *B. fasciculatus*.
- B. Glumes nearly equal or unequal; spikelets even after flowering narrower toward the tip.
 - I. Flowers, even in fruit, imbricated.
 - a) Margin of the lower glume more or less convex, not angled.
 - 1. Panicle dense, ovate to oblong; 4 cm long; spikelets 6—8-flowered; lower glume oblong, scarious-margined 6. *B. scoparius*.
 - 2. Panicle subdense, cylindrical, 10 cm long; spikelets 8—15-flowered; lower glume lanceolate-linear, membranous-margined 7. *B. alopecurus*.
 - b) Margin of the lower glume forming an obtuse angle at or above the middle.
 - 1. Spikelets 5—12-flowered; rhachilla scaberulous; lower glume oblong-elliptical, bidentate, with scarious division reaching to the base of the awn 8. *B. macrostachys*.
 - 2. Spikelets 6—20-flowered; rhachilla pubescent; lower glume narrower and shorter acute 9. *B. hordaceus*.
 - II. Flowers in fruit not imbricated 10. *B. japonicus*.

158. (1.) **Bromus villosus** Forsk. Flor. aeg.-arab. (1775), p. 23. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 174 no. 1234. — *Bromus rigidus* Roth in Roem. et Usteri Mag. d. Bot. fasc. X, p. 21. — Boiss. Fl. Or. V, p. 649. — Sickenberg. Contrib. Fl. d'Eg., p. 311. — Annual, tufted; culms geniculate-ascending or erect, 30 to 50 cm long, rigid, hairy above. Leaves densely hairy; panicle oblong, erect, simple; spikelets 6—8-flowered, glabrous or pubescent, 6—8 cm long; glumes unequal, linear lanceolate, acuminate, scarious-margined; lower glume

linear-lanceolate, acuminate, keeled, with about 5 prominent nerves, less than half as long as the awn. — Flow. March to April. —

M. ma. Mex; Mariut; Alexandria; Ramle; Mandara; Montaza. — **M. p.** Rosetta, everywhere in fields very common. Damietta a common weed in wheat-fields. — **N. f.** Kom Mushim, northern Fayûm; Medînet-el-Fayûm; Senûris; El-Edwa, common in fields. — **O.** Great Oasis: El-Kharge; Little Oasis, fields near El-Qasr; Oasis Dakhel, not rare; Farâfra. — **D. a. sept.** In wheat-fields near Karnak, common; Suâdi, near Minia, margins of the desert. — **D. i.** Wady-el-Arish. —

Throughout the Mediterranean region.

159. (2.) **Bromus tectorum** L. Spec. Plant. I (1753), p. 77. — Boiss. Fl. Or. V, p. 647. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 174 no. 1232. — Annual 10 to 50 cm high; erect or ascending, pubescent above. Panicle short, somewhat one-sided, pendulous, with capillary branches; spikelets with awns 3 to 4 cm long, 5—9-flowered, upper flowers male, at least spreading spirally, pubescent, rarely glabrous, linear; glumes lanceolate, scarious at the margins and the tip; lower glume linear-lanceolate, as long as or a little shorter than the straight awn. — Flow. March to April.

D. a. sept. Galâla.

A native of Europe, widely distributed throughout the Mediterranean region.

160. (3.) **Bromus matritensis** L. Amoen. Acad. IV (1759), p. 265. — var. **Delilei** Boiss. Fl. Or. V, p. 649. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 174 no. 1233. — Sickenberg. Contrib. Fl. d'Eg., p. 311. — Annual, tufted; culms geniculate-ascending or erect, 30—40 cm high. Leaves linear, flaccid; panicle nearly simple, dense, obovate-oblong; peduncles short, or as long as the spikelets, erect, or the lower ones somewhat recurved; spikelets glabrous or pubescent 5—12-flowered, 1—2 cm long, exclusive of the awns; flowers small; glumes linear-lanceolate, acuminate, lower half as long as the upper; flowering glumes generally green, the lower with more or less prominent lateral nerves, about as long as the awn. — Flow. April.

N. d. Rosetta; Miniêt Murshîd. — **N. f.** Kôm Mukhim. — **D. a. sept.** Environs of Helwan, everywhere in sandy and stony places; Wady Dugla; Wady Hamata; Wady Khafûra; Southern Galâla.

Also known from Spain and North Africa.

161. (4.) **Bromus rubens** L. Amoen. Acad. IV (1759), p. 265. — Briss. Fl. Or. V, p. 650. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 174 no. 1275. — Sickenberg. Contrib. Fl. d'Eg., p. 311. — **Bromus**

pupurascens Delile Fl. Aeg. Illustr., p. 52 no. 117. — Annual 20 to 30 cm high or more; erect, pubescent above. Panicle erect, compact, obovate, with very short branches; spikelets pubescent or glabrous, terete, slightly flattened, 4—8-flowered, upper flowers generally sterile; glumes lanceolate, acuminate, unequal, the upper twice as broad as the lower; flowering glume 5—7-nerved, scarious at the margin, acutely bifid; awn about as long as the glume, at length curved outward. — Flow. March to April.

M. ma. Matruqa; Ras-el-Kenais; Alexandria; Mex; Ramle; Mandara; Mariut-Mergheb, common on calcarious ground; Ramle.

Also known from other parts of North Africa.

162. (5.) **Bromus fasciculatus** Presl. Cyp. et Gram. Sicul. (1820), p. 39. — Boiss. Fl. Or. V. p. 650. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 174 no. 1236. — *Bromus rubens* Delile non L. (!) Flor.-Aeg. Ill., p. 52 tab. XI. fig. 2. — Annual 20 to 30 cm erect, glabrous. Leaves linear or linear, lanceolate. Panicle erect, compact, obovate-cuneate, with short, stiff branches; spikelets glabrous, rarely puberulent, flattened, few, loosely 8—10-flowered, the upper 1—2 flowers sterile; glumes linear-lanceolate, acuminate, unequal; flowering glume linear-awl-shaped, keeled, as long as its somewhat twisted awn; lateral nerves obsolete. — Flow. April.

M. ma. Alexandria, not common; Mergheb on calcarious ground.

— **M. p.** Damietta.

Mediterranean region.

163. (6.) **Bromus scoparius** L. Amoen. Acad. IV (1759), p. 266. — Boiss. Fl. Or. V, p. 650. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 174 no. 1237. — *B. chrysopogon* Viv. Flor. Libyc. Specim., p. 4 tab. II. — Annual 20 to 40 cm high, ascending, glabrous. Leaves subglabrous or hairy, narrow-linear, tapering to a fine point. Panicle erect, dense, ovate to oblong, 4 cm long, 1 to 2.5 mm broad, obtuse, with very short branches; spikelets pubescent or glabrous, 6—8-flowered; glumes lanceolate, acutish, scarious-margined, somewhat unequal; flowering glume oblong, scarious-margined, short-bifid, nearly as long as its spreading, at length twisted awn. — Flow. April to May.

M. a. Alexandria, Ramle, not common. — **M. p.** El-Arish. —

N. f. Gharaq; Abalije Salern Pasha.

Throughout the Mediterranean region.

164. (7.) **Bromus alopecurus** Poir. Voy. en Barb. II (1789), p. 100. — Annual, tufted, 40 cm high, geniculate-ascending or erect. Leaves linear to linear-lanceolate, 6—10 cm long, 6 mm broad.

Panicle erect, cylindrical. 10 cm long, 1 cm broad, often interrupted below, dense, branches short, appressed; spikelets pubescent, linear-lanceolate, 8—15-flowered; glumes unequal; flowering glume lanceolate-linear, membranous-margined, acutely bifid, shorter than the spreading, twisted awn. — Flow. March to April.

N. v. Gardens at Siut, not common.

Southern Europe and Mediterranean region.

165. (8.) **Bromus macrostachys** Desf. Flor. Atlant. I (1798), p. 96 var. **lanuginous** (Poir.) Boiss. Fl. Or. V, p. 174. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 174 no. 1238. — *Bromus lanuginosus* Poir. Encycl. méth. Bot. IX. p. 703. — Annual tufted, 30—60 cm high; culms geniculate-ascending or erect, glabrous. Leaves narrow-linear, 6—12 cm long. Panicle erect, with short stiff branches; spikelets glabrous or glabrescent, 2—3 cm long including the awns, oblong, lenticular, tomentose, 10—16-flowered. Glumes unequal, oblong-lanceolate, obtusish, many-nerved; flowering glume oblong-elliptical bidentate, with scarious divisions reaching to the base of the awn, shorter than the spreading, at length twisted awn. — Flow. March to April.

N. v. Old Cairo, walls near Bulaq, not rare; Basetin.

Throughout the Mediterranean region.

166. (9.) **Bromus hordaceus** L. Spec. Plant. I (1753), p. 77. — var. **glomeratus** (Tausch) Aschers.-Schweinf.-Muschler comb. nov. — *Bromus mollis* L. Spec. Plant. ed. II (1762), p. 112. — var. *glomeratus* (Tausch) Aschers. and Schweinf. Ill. Fl. d'Eg. (1887), p. 174. — *Bromus glomeratus* Tausch in Flora (1837), p. 124. — Annual, tufted; culms erect or ascending, villous to glabrous. Leaves linear, acute, flaccid, subhirsute above, pubescent beneath; sheaths velvety or softly hairy; ligule very short, denticulate, glabrous or hairy; panicle erect, rhachis hairy; branches 3—6-nate, scabrid or softly pubescent; spikelets pale green, densely 5—12-flowered, rhachilla scaberulous; glumes lanceolate-oblong, the lower narrower and shorter, acute; flowering glume oblong-lanceolate, prominently 7—9-nerved, apex short-bidentate, awn inserted at the sinus, shorter than the glume or the upper ones a little longer. — Flow. April.

M. ma. Alexandria. — **N. d.** Cairo, Giza, Bulaq, not rare.

Throughout the Mediterranean region.

167. (10.) **Bromus japonicus** Thunberg. Flor. japon. (1784), p. 57 tab. 11. — var. **aegyptiacus** (Tausch) Aschers.-Schweinf.-Muschler comb. nov. — *Bromus patulus* Mert. and Koch in Röhl. Deutschl. Flor. I (1823), p. 685. — var. *aegyptiacus* (Tausch) Aschers. and Schweinf.

Ill. Fl. d'Eg., p. 175 no. 1240. — *Bromus brachystachyus* Boiss. Fl. Or. V, p. 654 nec Hornung. — *Bromus aegyptiacus* Tausch Flor. (1837), p. 125. — Sickenberg. Contrib. Fl. d'Eg., p. 311. — Annual; culms fascicled or tufted, geniculate, shortly ascending or suberect, slender to stout, 15—50 cm high, glabrous, smooth or scaberulous to pubescent below the panicle and the nodes, 2—4-noded, upper internodes exerted, uppermost very long; leaves finely hairy to villous; sheaths rather tight, thin, strongly striate; ligules delicate, $\frac{3}{4}$ to almost 3 mm long, fimbriate-toothed; blades linear, tapering to an acute point, 4—8 cm long, $1\frac{1}{2}$ —6 mm broad, flat, flaccid; panicle usually more or less nodding, 6—10 cm long, broadly ovoid when quite open; axis terete, striate, scabrid; branches in rather distant semiwhorls, lower 3—6-nate, 2—1- (rarely 3-) spiculate, nodding, finely filiform, very flexuous, scabrid; lateral pedicels 3 to more than 10 mm long; spikelets oblong, light green or purplish, 18 to 20 mm long, 7—10-flowered; rhachilla joints clavate, smooth or almost so, up to 2 mm long; glumes unequal, oblong, acute, lower 6—8 mm long, 1—3-nerved, upper broader, 4— $10\frac{1}{2}$ mm long, 5—7-nerved, scaberulous on the nerves; flowering glumes obliquely oblong, 4—10 mm long (in the Egyptian specimens), 7- to sub-9-nerved, scaberulous or scabrid at least towards the tips, rarely quite smooth, widest at the middle or slightly above it, margins gently curved from this point towards the tip and white, shining and hyaline, straight towards the base; awn from 2—4 mm below the entire or denticulate or 2-toothed hyaline tips, straight to recurved, 10—17 mm long, fine; pales 4— $4\frac{1}{2}$ mm long, keels distantly ciliate; anthers elliptic, 0.5—2 mm long; stigmas 2 mm long; grain 8 to 10 mm long, tightly adhering to the glume and pale, strongly convexo-concave. — Flow. May.

M. ma. Alexandria. — **N. d.** Miniet-el-Murshîd; Damanhûr; Tanta; Zifta; Zagaziq, in gardens and fields; Cairo, common; Tell-el-Kebir. — **N. f.** Medinet-el-Fayûm, in fields; Senhûr; Senûris; Tomia, common in fields. — **N. v.** Beni-Suêf, in fields, not rare; Minia, a weed in gardens; Abu-Fêda, rare. — **D. i.** Sâlihiya. — **D. a. sept.** Southern Galala, Wady Om Ruthi and Gizly. —

Local name: bakhringân-el-qhûl (Aschers.)

The typical is widely distributed throughout the Mediterranean region, and often founded in Egypt between the variety.

74. (57.) *Brachypodium* P. Beauv.

Spikelets at first cylindric, then laterally compressed, in a simple raceme or false spike with very short pedicels, with the flattened side to the axis; rhachilla glabrous, disarticulating above the empty glumes and

between the flowering glumes. Flowers 5 to many, bisexual, the uppermost more or less reduced. Empty glumes more or less unequal, firm, strongly 3—7-nerved, lower often slightly asymmetric. Flowering glumes oblong to oblong-lanceolate, usually narrowed into a straight awn, or mucronate, rounded on the back, closely imbricate at first, then more or less diverging and rolling inward, 7-nerved, nerves prominent in the upper part, faint below; callus very short, obtuse. Pales oblong, rather broad, very obtuse or truncate, slightly shorter than the flowering glume, 2-keeled, keels rigidly ciliate. Lodicules 2, lanceolate, usually ciliate. Stamens 3, rarely 2. Ovary with a villous appendage at the top; styles laterally inserted on the appendage, very short; stigmas plumose, laterally exerted. Grain linear or linear-oblong, convexo-concav, adhering more or less to the pale; embryo small; hilum filiform, long. — Perennial or annual; blades flat or setaceously involute; racemes terminal, joints of axis more or less hollowed out (at least the lower) on the side facing the spikelets; spikelets usually few (sometimes 1), erect or spreading, rather large.

Species about 15, often very difficult to discriminate, mainly in the temperate regions of the northern hemisphere.

168. **Brachypodium distachyum** P. Beauv. Ess. Agrost. (1812), p. 101. — Boiss. Fl. Or. V. p. 657. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 175 no. 1241. — Sickenberg. Contrib. Fl. d'Eg., p. 311. — Annual; culms fascicled, or simple or branched below, often very strongly and repeatedly geniculate, ascending, 15–35 cm long, glabrous or sparingly hairy below the nodes, smooth or slightly rough in the upper part, 3—4-noded, internodes exerted, uppermost one ultimately becoming by far the longest; sheaths rather tight, herbaceous, striate, spreadingly hairy or finely pubescent or glabrescent, spreadingly ciliate along the upper margins, finely tomentose at the nodes; ligules very obtuse, finely pubescent to villous, up to 2 mm long; blades linear, tapering to an acute point, 2—8 cm long, $1\frac{1}{2}$ —3 mm broad; flat, slightly rigid to sublaeacid, scabrid and more or less spreadingly hairy all over; false spike erect, straight, 2-ranked, 4—1- (rarely to 6-) spiculate, up to 6 cm long; rhachis slightly rough except at the scabrid margins, striate; pedicels stout, very short or obsolete; spikelets erect, adpressed, 1 to more than 3 cm long, glabrous or sparingly hairy, 6–12-flowered; glumes subulate-lanceolate, very acute, lower $2\frac{1}{2}$ –6 mm long, 4- to sub-6-nerved, upper about $6\frac{1}{2}$ mm long, 7-nerved, nerves very prominent; flowering glumes lanceolate-acuminate, 8—9 mm long, firmly chartaceous, scaberulous above, 7-nerved; awn 8–19 mm long, very short or absent in the lowest flowers; pales about $6\frac{1}{2}$ mm long, keels very rigidly ciliate

in the upper part: stamens 2—3; anthers oblong to ellipsoid: grain oblong-linear. — Flow. April.

M. ma. Matruqa; Alexandria; Mariut-Bringhi, not rare: Montaza; Mex: Ramle in gardens; Mandara; Abukir, common. — **M. p.** Rosetta, in fields and gardens, but not common; Damietta, in fields, not common: El-Arish. — **N. f.** Medinet-el-Fayûm; Biahmu, a weed in fields; Senûris, common in fields; Tonia. — **O.** Siwa: Little Oasis. Farâfra; Dakhel; Great Oasis. —

Widely distributed in Europe and Asia.

75. (58.) *Lolium* Linn.

Spikelets usually more or less compressed, 2-ranked, alternate, sessile in the hollows of the rachis of a simple spike: rachilla glabrous, dis-articulating above the empty glumes and between the flowering glumes. Flowers 3—11, or sometimes more, bisexual or the uppermost ones reduced. Empty glumes of terminal spikelets equal and similar, lower ones suppressed in the lateral spikelets, upper ones linear to oblong, obtuse to acute, flat or slightly rounded, coriaceous, prominently 7—9-nerved. Flowering glumes oblong, rounded on the back, subovate, minutely 2-toothed (or acute in profile, more or less chartaceous except at the short hyaline tips, glabrous, 5-nerved, mucous or awned: awn a straight bristle from close to the tip. Palea equalling the flowering glumes or nearly so, 2-keeled, keels more or less crested. Stamens 3. Lodicules 2, lanceolate with a lateral tooth. Ovary glabrous, truncate; styles distinct, very short, stigmas laterally exerted, plumose. Grain elliptic-oblong to linear-oblong, tightly enclosed by the flowering glume and pale, adhering to both: embryo short; hilum linear, almost as long as the grain. — Annual or perennial: blades linear, flat; ligules hyaline: spikes terminal: spikelets more or less erect, 2-ranked, with the (upper) glume opposite the hollow of the rachis.

Species 6—8 in the temperate regions of Europe, Asia, and North Africa, elsewhere introduced.

A. Annual plants.

I. Flowers turgid, the uppermost ones equalled
or exceeded by the glume 1. *L. temulentum*.

II. Flowers not turgid:

a) Rather tall; spikes 15—30 cm long; axis
rather slender; glume much shorter than
the spikelet 2. *L. multiflorum*.

b) Short; spikes 8—15 cm long; axis stout and
stiff; glume equalling the spikelet 3. *L. rigidum*.

B. Perennial plants 4. *L. perenne*.

169. (1.) **Lolium temulentum** L. Spec. Plant. I (1753), p. 83. — Boiss. Fl. Or. V, p. 681. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 178 no. 1250. — Sickenberg. Contrib. Fl. d'Eg., p. 314. — Annual; culms fascicled or solitary, erect, rather stout, straight, 10—40 cm long, glabrous, rough, at least in the upper part, 2—4-noded, uppermost internode usually long exserted; leaves glabrous; sheaths rather tight, strongly striate; ligules very short, truncate; blades linear, acute, 15 to 31 cm long, 2—6 mm broad, flat, rough all over or only on the upper side and along the margins; spikes erect, 8—31 cm long, of rather numerous (10—20) spikelets; axis rather stout, slightly rough or smooth on the back; spikelets about the length of the internodes, or the lower shorter and more distant, the upper more approximate, laterally compressed, 5—9 mm long, 5 to 9-flowered: flowers turgid: upper glume oblong, equalling or somewhat exceeding the uppermost flower, subobtuse to acute, very rigid, flat, glabrous, smooth, 7—9-nerved; flowering glumes elliptic-oblong, obtuse or subobtuse, mucous or usually awned, 6—8½ mm long, rounded on the back, herbaceous-chartaceous, smooth, 5-nerved, tips rather broad, hyaline, obscurely 2-toothed; awn subterminal, straight, rather stout at the base, scaberulous, up to 18 mm long; pales broad, keels green, stout; anthers over 2 mm long; grain elliptic-oblong, semiterete, grooved in front, slightly shorter than the pale. — Flow. April.

M. ma. Alexandria; Montaza; Ramle, not rare, along the walls; Mandara, in sandy places; Abukir. — **M. p.** Rosetta, everywhere as a weed in fields and gardens; rare in sandy places; Damietta, not rare; El-Arish. — **N. d.** Damanhûr; Tanta, common on way-sides; Zaqaziq, in fields; environs of Cairo Gasatin (Wady Tumilat). — **N. v.** Old Cairo, Bulaq, everywhere; Giza in gardens as a weed; Siut; Minia, Luksor. — **O.** Little Oasis.

Temperate regions of Europe, Asia, and North Africa.

170. (2.) **Lolium multiflorum** Lam. Flor. Franç. III (1778), p. 621. — Boiss. Fl. Or. V, p. 679. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 178 no. 1248. — Sickenberg. Contrib. Fl. d'Eg., p. 314. — Annual; culms fascicled, geniculate, ascending or erect, 15—30 cm long, glabrous, smooth or slightly rough in the upper part, 4—5-noded, internodes at length more or less exserted, simple or branched below; leaves glabrous; sheaths striate, smooth, lower sometimes purplish; ligule very short, truncate from an auricled base; blades linear, long tapering to a very slender point, 4—18 cm long, 1—3½ mm broad, flat, somewhat rigid, scabrid on the upper side and along the margins; spikes erect, 15—30 cm long, of numerous (12—30) spikelets; axis rather slender, smooth except at the scabrid margins; internodes (except the lowest) distinctly shorter than the spikelets; spikelets

strongly compressed from the side, elliptic-oblong, 10—18 mm long, obliquely erect, 9—11-flowered, uppermost flower long exserted from the glume; upper glume narrow, oblong, subobtusely, somewhat rounded on the back, equalling the contiguous flower or nearly so, strongly 7-nerved; flowering glumes awned or mucous, oblong, $2\frac{1}{2}$ —6 mm long, subherbaceous-chartaceous, light green, or tinged with purple above, 5-nerved, smooth; awn (when present), straight, very fine, $2\frac{1}{2}$ —8 mm long, close to the short hyaline minutely 2-toothed tip; keels of pales green, crested, scabrid; anthers $1\frac{1}{2}$ —4 mm long; grain linear-oblong, semiterete, $2\frac{1}{2}$ mm long, deeply channelled in front, adhering to the glume and pale. — Flow. April to May.

M. ma. Mex. common; Mariut-Brighi, not rare; Ramle, a weed in fields and gardens. — **N. d.** Shirbîn, Mansura, on way-sides; Tanta; Zaqaziq, Qalyûb; Cairo, common. — **O.** Great Oasis. — **D. a. sept.** Suez: Ayûn Mûsa.

Temperate regions of Europe and Asia.

171. (3.) **Lolium rigidum** Gaud. in Agrost. Helv. I (1811), p. 334. — Boiss. Fl. Or. V, p. 680. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 178 no. 1249. — Sickenberg. Contrib. Fl. d'Eg., p. 314. — Annual, tufted, culms fascicled, geniculate, ascending or erect, 20 to 50 cm long, glabrous; root destitute of clusters of sterile leaves; leaves linear, flat, glabrous; sheaths striate, smooth; ligule very short, truncate from an auricled base; spike stiff often incurved; spikelets oblanceolate, 3—9-flowered, appressed to the rachis; glume linear-lanceolate, obtuse, a little shorter than the spikelets; pales mucous; grain linear-oblong. — Flow. April.

M. ma. Alexandria not rare; Sidi Gaber, in sandy places; Mandara, Ramle, not rare. — **M. p.** Rosetta, not common; Damietta, in fields and gardens, rare; El-Arish. — **O.** Siwa; Little Oasis. — **D. i.** El-Qantara: Es-Sâlihiya, in sandy places; Ismalia, Suez, not rare in deep sand. — **N. v.** Old Cairo, Island of Roda, Gezire in gardens as a weed; Siut, in fields; Minia, common weed.

Local name: sammah (Ascherson) nusseyle (Schweinf., Muschler).

var. **compressum** (Boiss. et Heldr.) Boiss. Flor. Or. V (1884), p. 680. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 178 no. 1249. — *Lolium compressum* Boiss. et Heldr. in Boiss. Plant. Orient. Diagn. ser. 2 IV, p. 144. — Annual or biennial; culms tufted but destitute of sterile leaf-clusters, decumbent; spike usually curved; spikelets close, often imbricated, broader than in the type. — Flow. March. —

M. ma. Ramle, not rare.

Local name: Nusseyle.

Temperate regions of Europe, Asia, and North Africa.

172. (4.) **Lolium perenne** L. Spec. Plant. I (1753), p. 122. — Boiss. Fl. Or. V, p. 679. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 178 no. 1247. — Sickenberg. Contrib. Fl. d'Eg., p. 314. — Perennial, creeping; culms elongated, woody branched and widely creeping below. Leaves 6—10 cm long and 1—5 mm broad, spreading or erect, acuminate, glaucous; sheaths glabrous or the mouth ciliate; ligule inconspicuous. Spikes erect, 4—12 cm long, fragile, shortly peduncled; rhachis glabrous; spikelets 2-flowered, rhachilla elongate, bearing an upper imperfect flower; empty glumes 1 or 2 in the uppermost spikelet, flat, rigid, closely appressed to the rhachis; flowering glumes much shorter than the empty glumes, elliptic, concave, 3-nerved; pales 2-keeled; lodicules fleshy, obliquely truncate or 2-lobed, glabrous. Grain oblong. — Flow. March to April.

N. d. Damanhûr; Fûa; Mansura; Tanta; Zifta; Tukhy; Zaqaqîq; Cairo, everywhere common. — **N. f.** Medînet-el-Fayûm; Senhûr; Senûris; Abuxa; Fidemîn, in fields. — **N. v.** Roda, in fields; Ekhmîm; Kene; Karnak; Esne; Aswân, not rare.

Local name: hashish-el-farâs (Forsk.) generally: samma.

Throughout the temperate regions of Europe, Asia, and Northern Africa, introduced everywhere.

76. (59.) **Agropyrum** P. Beauv.

Spikelets more or less laterally compressed, alternate, distichous, sessile at the hollows of, and with the flattened side to, the tough or disarticulating rhachis of a simple spike; rhachilla disarticulating above the glumes and between the flowering glumes or almost tough. Flowers 3 to many, bisexual or the uppermost ones reduced, exceeding the glumes. Glumes equal or subequal, lanceolate, linear or oblong, rigid, prominently 5- to many-nerved, usually somewhat asymmetrical. Flowering glumes lanceolate to oblong in profile, obtuse and sometimes 3-toothed or mucronate or acuminate or produced into an awn, more or less coriaceous, 5- (rarely 7 -9-) nerved, nerves faint or partly evanescent below; callus very obtuse and short. Pales somewhat shorter than the flowering glumes, acutely 2-keeled or keels somewhat winged, ciliate. Lodicules 2, rather large, oblique or unequally lobed, densely ciliate. Stamens 3. Ovary obovoid with a large villous top; styles hardly any; stigmas delicately plumose. Grain tightly enclosed and adhering to the flowering glume and pale or at least to the latter, linear-oblong, plano- or slightly concavo-convex; embryo short; hilum filiform as long as the grain. — Perennials with an often long creeping rhizome; blades flat or convolute; ligule scarious; spikelets usually long and slender, rigid, rarely

stout (in the Egyptian species); spikelets appressed to the rhachis, usually rather large.

Species 30—35, mainly in the temperate region of Europa and Asia, 1 or 2 widely spread weeds.

A. Culms ascending from a long creeping slender

branched rhizome 1. *A. junceum*.

B. Culms ascending from fibrous roots 2. *A. elongatum*.

173. (1.) **Agropyrum junceum** (L.) P. Beauv. Essai Agrost. (1812), p. 102. — var. **Sartorii** Boiss. and Heldr. in Boiss. Fl. Or. V (1884), p. 665. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 175 no. 1242. — Perennial; culms ascending from a long creeping slender branched rhizome, 15—60 cm high, stout, glabrous, smooth, closely sheathed all along, many-noded; sheaths rather loose or the upper tumid, smooth, thick, somewhat spongy, lower at length becoming scarious and withering away; ligules membranous, obtuse, $2\frac{1}{2}$ mm long; blades linear, subulate-convolute, subpungent, 15 to more than 30 cm by as much as $6\frac{1}{2}$ mm (when expanded) thick, rigid, smooth on the back, prominently and closely striate above, very minutely and densely tomentose above; spike erect, straight, very stout, 6—9 mm long, of 3—16 spikelets; rhachis stout, very brittle; internodes much shorter than the spikelets, 1—1.5 cm long or the lowest up to 2 cm, smooth; spikelets more or less elliptic in outline when open, stout, 2— $2\frac{1}{2}$ cm long, adpressed to the rhachis, glabrous, 6—11-flowered; rhachilla-joints stout, cuneate, puberulous; glumes equal, lanceolate to oblong, more or less asymmetrical (the side facing the axis much narrower), obtuse, minutely notched, 20—21 mm long, coriaceous, smooth, glabrous, up to 15-nerved, keeled; flowering glumes ovate-lanceolate in profile, 3-toothed or mucronate with 2 lateral teeth, lowest one 19—20 mm long, subcoriaceous, smooth, 7—9-nerved, keeled in the upper part; pales elliptic, minutely truncate, $12\frac{1}{2}$ — $17\frac{1}{2}$ mm long, almost 9 mm (when flat) broad, very finely velvety all over, keels broadly winged, wings densely ciliolate; anthers $6\frac{1}{2}$ mm long. — Flow. April.

M. ma. Sandy shore near Matruqa; Alexandria; Mandara; Sidi Gaber, Mex, not common. — **M. p.** Brullus; Damietta.

Local name: seyfun.

Also known from Abyssinia.

174. (2.) **Agropyrum elongatum** (Host) P. Beauv. Essai Agrost. (1812), p. 102. — Boiss. Fl. Or. V, p. 605. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 175 no. 1243. — *Triticum junceum* Host Gram. Austr. II tab. XIII. — Perennial; culms ascending from fibrous roots, 10 cm or more long, erect. Leaves elongated linear, flat, scabrous at the upper

surface, with many nerves, rough. Spike 6—15 cm long. 5—7 mm broad; spikelets a little longer than the internodes, appressed, oblong-lenticular to oblong, 1—1.5 cm long, 2-ranked, with 5—13-flowers; axis not brittle; glumes glabrous, nearly equal, half as long as the spikelets, linear-oblong, obtuse. — Flow. March to April.

M. ma. Alexandria, Mandara, not common. — **M. p.** Rosetta; Damietta; El-Arish. —

Local name: seyfûn. —

Widely distributed throughout the Mediterranean region.

77. (60.) **Triticum** Linn.

Spikelets 2—5-flowered, solitary and sessile at the joints of the rachis, forming dense, terminal spikes; rachilla articulated between the flowers; lower flowers in each spikelet bisexual, the upper ones staminate or imperfect. Empty glumes at the base of the spikelet 2, rigid, usually shorter and narrower than the flowering glumes, short-awned or awnless; flowering glumes oblong, ventricose or rounded on the back, sometimes keeled above, 5—9-nerved, awned or awnless; pale 2-keeled, keels ciliate. Stamens 3. Style very short; stigmas plumose. Grain ovoid or oblong, sulcate, hairy at the apex, free or adherent to the pales. — Annual, erect grasses with terminal, cylindrical spikes.

The species of this genus are cultivated in many parts of the World.

175. **Triticum vulgare** Vill. Hist. Plant. Dauph. II (1787), p. 133. — An annual, with terete, simple culms, 60 cm to 2 m high. Leaves narrow lanceolate, striate, usually scabrous on the upper surface. Sheaths striate, smooth; ligule short, truncate. Spikes 6 to 12 cm long, dense, four-sided, axis compressed, rather broad, margins hirsute; spikelets broadly obtuse, 3—5-flowered; glumes ventricose, obtuse, mucronate or awned. — Flow. December and April.

M. ma. Mandara, subsponaneous!

Wheat is grown in all parts of Egypt.

78. (61.) **Aegilops** Linn.

Spikelets sessile at each joint of the rachis, 3-several-flowered, parallel to the rachis, the terminal spikelet, or the upper 2—3 barren, more slender than the others. Empty glumes 2, coriaceous or cartilaginous, convex, not keeled, many-nerved at the back, truncate at the tip, entire or toothed, teeth sometimes long-awned. Flowering glume papyraceous, convex, not keeled, many-nerved,

nerves not connivent at tip, 1—3-toothed, teeth mucicous or awned; pale with 2, ciliated keels. — Annuals.

A small genus of only 15—20 species, widely distributed throughout the Mediterranean region.

A. All the glumes long awned.

I. Spike ovate, dense; spikelets 3—4; each 3—4-flowered 1. *A. ovata*.

II. Spike linear, slender; spikelets 5—7; each 3—4-flowered 2. *A. triuncialis*.

B. All the glumes mucicous.

I. Flowering glume oblong, all produced into a scabrous awn, twice to ten times as long as the pale 3. *A. bicornis*.

II. Flowering glume ovate, only those of the uppermost spikelet produced into a awn ten to fifteen times longer than the awn 4. *A. longissima*.

176. (1.) **Aegilops ovata** L. Spec. Plant. I (1753), p. 1050. — var. **triaristata** Coss. et Dur. in Coss. and Dur. Explor. scient. Algér. II. p. 210. — Boiss. Fl. Or. V, p. 673. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 177 no. 1244. — Sickenberg. Contrib. Fl. d'Eg., p. 314. — Annual, tufted. Culms geniculate-ascending or erect, 20 to 40 cm long. Leaves linear to linear-ovate. Spike ovate, dense, 2—4 cm long; spikelets 3—5, two or three of the lower spikelets rudimentary, others 3—4-flowered, ovate, narrowed at the top, the upper 1 or 2 barren, 1-flowered; glumes inflated. 2—3-awned, the awns of both glumes and pales nearly equal. — Flow. March to April.

M. ma. Alexandria, not common; Mex; Ramle. — **M. p.** El-Arish. —

Throughout southern Europe and the Mediterranean region.

177. (2.) **Aegilops triuncialis** L. Spec. Plant. I (1753), p. 1051. — Boiss. Fl. Or. V, p. 674. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 178 no. 1245. — Annual; culms erect, glabrous, 20 to 40 cm long. Leaves linear. Spike linear, slender, 5—6 cm long; spikelets 5—7, each 2—3-flowered, oblong, the uppermost one sterile, and the lower two ones or three ones rudimentary; glumes not inflated, 3-awned, or those of the lower spikelets 2-awned; awns of the upper spikelets twice as long as those of the lower; flowering glumes of the lower spikelets 3-toothed or short-awned; those of the terminal spikelet long awned. — Flow. March to April. —

M. ma. Alexandria; Mandara not common.

Local name: Medadath. —

— — var. **brachyathera** Boiss. in Flor. Or. V (1884), p. 674.
 — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 178 no. 1245. — Awns short, the terminal ones about twice to four times as long as the glume. — Flow. March.

M. ma. Alexandria, not common; Ramle. —

Throughout the Mediterranean region.

178. (3.) **Aegilops bicornis** (Forsk.) Jaub. et Spach Illustr. Plant. Orient. IV (1850) tab. CCCIX. — Boiss. Fl. Or. V, p. 677. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 178 no. 1246. — Sickenberg. Contrib. Fl. d'Eg., p. 314. — *Triticum bicornis* Forsk. Flor. aeg.-arab., p. 96. — Annual, tufted, culms 30 to 60 cm high. Spike not including awns 0.6 to 1 cm long, 8 mm broad, 2-ranked; spikelets somewhat longer than the internodes, about 3-flowered, the upper flower tabescent, not awned; empty glumes coriaceous, obliquely oblong, convex, truncate or retuse at tip, 1—2-denticulate, scabrous at nerves, somewhat shorter than the flowering glumes; flowering glumes oblong, all produced into a scabrous awn, twice to ten times as long as the pale, the lateral nerves at the base of the awn sometimes produced into a short mucro. — Flow. April and May. —

M. ma. Matruqa; Dakalla; Alexandria, Mex; Montaza; Mandara; Ramle in sandy places, not rare; Abukîr. — **M. p.** Rosetta, Damietta.

Local name: sha'îr-el-fâr. —

Cyrenaica, Marmarica, western Asia eastward to Mesopotamia.

179. (4.) **Aegilops (Triticum) longissima** Schweinfurth and Muschler spec. nov. — A caespitose annual; culms slender, erect, from a spreading ascending base, with numerous short internodes, geniculate, internodes, terete or subcompressed, glabrous or hairy, closely sheathed all along, many-noded; sheaths rather loose or the upper tumid, smooth, thick, somewhat spongy, lower at length becoming scarious and withering away; ligules membranous, obtuse; blades linear, subulate-convolute, subpungent 6—15 cm long, 3—6 mm broad, thick, rigid, on both sides densely hairy. Spikes not including awns 20—25 cm long, 3—4 mm broad, 2-ranked; spikelets 15—20, longer than the internodes, densely appressed to the rhachis, about 2—3-flowered, the upper flower tabescent; empty glumes coriaceous, ovate, convex, membranous-margined, more or less asymmetrical, the side facing the axis much narrower, keeled, smooth, glabrous, up to 10-nerved; flowering glumes ovate-lanceolate to lanceolate in profile, 2-toothed, or mucronate, subcoriaceous, smooth, 5—7-nerved, keeled in the upper part; pales elliptic, mucronate, those of the

terminal flower produced into a scabrous awn, ten to fifteen times longer than the pale; anthers 6 mm long. — Flow. April.

M. ma. Mariut-Mergheb, abundantly on calcareous ground.

Near *A. squarrosa* which it closely resembles in habit, but is a more robust plant with broades spikelets and much longer spikes.

79. (62.) *Lepturus* R. Br.

Spikelets solitary, immersed in the hollows of the rhachis, 1-flowered, with occasionally a rudiment of another flower, or 2-flowered. Empty glumes of all the spikelets 2, coriaceous, many-nerved, in the lateral spikelets placed edge to edge in front of spikelet, open before flowering, then closed, in the terminal spikelet opposite. Flowers membranous, oblique to the axis, the flowering glumes of equal length, concave, muticous; pale 2-keeled. — Annuals, with filiform spikes; blades flat or involute; ligules membranous, short; spike slender, more or less cylindric, straight or curved, disarticulating, when ripe or almost tough; empty glumes spreading during flowering, then appressed.

Species 3, in the warm coast regions of the Old World.

180. *Lepturus incurvatus* Trin. Fund. agrost. (1820), p. 123. — Boiss. Flor. Or. V, p. 684. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 178 no. 1251. — *Monerma cylindrica* Boiss. Fl. Or. V, p. 683 ex parte. — *Lepturus filiformis* Trin. Fund. agrost., p. 123. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 178 no. 1252. — Annual, tufted; 10 to 40 cm high; culms clustered, decumbent or ascending, incurved, often branching at the base. Leaves linear, flat, the uppermost near the base of the spike. Spike 5 to 20 cm or more long, 1—1.5 mm broad, spikelets usually longer than the internodes; glumes coriaceous, equal, 3—5-nerved, longer than the flower; pales lanceolate acuminate; anthers minute, ovate-oblong. — Flow. February to May. —

M. ma. Matruqa Alexandria, Mex, Mariut-Mergheb, common; Sidi Gâber, Ramle, Montaza; Abukîr, not rare. — **M. p.** Rosetta, in sandy places, often in fields; Damietta, as a weed on margins of the fields; El-Arish. — **N. d.** Damanhûr, Desûn; Shirbîn, Mansura, common; Tanta, Cairo everywhere as a weed; Birket-el-hadj; Sâlihiya. — **N. f.** Medînet-el-Fayûm, not common; El-Hammâm, in sandy places, rare Gharaq. — **N. v.** Old Cairo, Gezîre; Beni-Suêf, bords of the Nile; Minia, in gardens; Abu-Fêda. — **O.** Little Oasis. **D. l.** Abu-Roash, margin of deserts, South of the Pyramids of Giza. — **D. a. sept.** Ayûn-Mûsa, near Suez.

Local name: haidah; timzeyn; Shu'air (Muschler).

Widely spread throughout the Mediterranean region.

80. (63.) **Hordeum** Linn.

Spikelets in groups of 3 at the nodes of the disarticulating (except in cultivated forms) rachis of a dense spike; rachilla tough, produced as a bristle beyond the flower, sometimes bearing a rudimentary glume. Flower 1, bisexual, in the intermediate spikelet, male or barren (bisexual sometimes in cultivated races) in the lateral. Empty glumes subulate or bristle-like or narrowly linear and awned, rigid, 1—3-nerved, persistent, more or less collateral and together forming a kind of involucre. Flowering glumes lanceolate, subinvolute, rounded on the back, gradually produced into a bristle-like awn, 5-nerved. Pale about as long as the flowering glume (exclusive of the awn), 2-keeled, narrowed, deeply folded between the keels. Lodicules 2, lanceolate, ciliate or ciliate, hyaline. Stamens 3. Ovary villous at the top; styles very short, terminal; stigmas laterally exserted, plumose; grain tightly enclosed and usually adhering to the flowering glume and pale, ovoid-oblong or narrow-oblong, rounded on the back, grooved in front; embryo short; hilum filiform, very long. — Perennial or annual; blades flat; ligules hyaline; spike cylindric, dense, usually very bristly from the awns and bristle-like glumes, usually very fragile in the wild species.

Species about 12, mainly in the temperate regions of the northern hemisphere.

- A. Stems 50 to 100 cm high; spikes 20—30 cm long;
glumes ciliate-plumose 1. *H. vulgare*.
- B. Stems 10—35 cm high; spikes 2—4 cm long.
 - I. Empty glumes of all the spikelets slightly
dilated at the base, not ciliate, and one of
each lateral spikelet broader than the rest . . . 2. *H. maritimum*.
 - II. Empty glumes of the central spikelet lanceolate,
and ciliate at the base; of the others awn-
like from the base 3. *H. murinum*.

181. (1.) **Hordeum vulgare** L. Spec. Plant. I (1753), p. 84.
var. spontaneum Körnicke Brauw. V (1882), p. 206. — *Hordeum spontaneum* K. Koch in *Linnaea* XXI (1848), p. 300. — Körnicke and Werner Handb. Getr. I, p. 141. — *Hordeum Decaisnai* Hort. Paris et Boiss. Fl. Or. V, p. 383. — *Hordeum itahurense* Boiss. Diagn. Plant. Or. Sér. I, fasc. XIII, p. 70. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 178 no. 1252. — Sickenberg. Contrib. Fl. d'Eg., p. 315. — Annual, 50 to 100 cm high, erect. Leaves flaccid, linear, acuminate. Spike (with awns) 20 to 30 cm long, 8 to 10 mm broad, flattened, 2-ranked, with brittle axis; lateral spikelets stipitate, staminate,

muticous; perfect in the middle, sessile, aristate; glumes lanceolate-subulate at the base, ciliate-plumose, the longer awns once and a half as long as the sterile flowers, empty glumes of the lateral spikelets muticous; awn of the fertile glume scabrous, 15 to 30 cm long. — Flow. March.

D. i. Desert-el-Tih.

Also known from Cyrenaica and Marmarica; everywhere in the Orient from Palestine to Persia.

This species may be the original of the cultivated species *Hordeum distichum* L.

182. (2.) **Hordeum maritimum** With. Bot. Arrang. Brit. Plant. (1776), p. 172. — Boiss. Fl. Or. V, p. 687. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 179 no. 1254. — Very near the following *H. murinum*, but smaller and somewhat glaucous, the spikes smaller, with shorter awns, and 3 pairs of outer glumes all lanceolate at the base but not ciliate, and one of each of the lateral pairs a little broader than the others. — Flow. March to April.

M. ma. Marmarica; Alexandria, in waste places; Ramle in sandy places; Mandara; Abukir, not rare. — **M. p.** Rosetta, Ma'adiyin, in sandy places; Damietta, common as a weed in fields and in sandy places. — **N. d.** Cairo, in gardens of the Bâb-el-Husseyiniyin; Shirbin, common; Zifta, Tanta, Zağaziq, Qalyûb; environs of Cairo everywhere. — **N. f.** Fayûm, on fields near Tomia; Medinet-el-Fayûm. — **N. v.** Beni-Suêf, in gardens; Siût, not rare. — **O.** Kharge in the Great Oasis, not rare. — **D. a. sept.** Wady Hamata near Gebel Atâqa.

On the seacoasts of western Europe, and all round the Mediterranean extending northwards to Denmark.

183. (3.) **Hordeum murinum** L. Spec. Plant. I (1753), p. 85. — Boiss. Fl. Or. V, p. 687. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 179 no. 1253. — Annual, tufted; culms erect or usually geniculate-ascending, 15—35 cm long, glabrous, smooth, about 4-noded, sheathed all along or some of the internodes exserted; lower sheaths membranous, whitish, striate, glabrous or scantily hairy, upper herbaceous, looser, uppermost usually very loose, tumid; ligules hyaline, truncate, denticulate, about 1 mm long; blades linear, tapering to an acute point, produced at the base into sometimes long, semilunar membranous auricles, up to 18 cm by as much as 8 mm, the upper often very short, flat, flaccid, dull green, loosely hairy on both sides; spikes erect or nodding, $1\frac{1}{2}$ —6 cm long, light green; rhachis fragile, flattened, margins scabrid; spikelets 3 at each node, intermediate sessile, lateral shortly pedicelled, male or barren; glumes

of the intermediate spikelet equal, very narrow, lanceolate-linear, produced into a stiff scabrid awn, 8—10 mm long (with the awn up to 2 cm long), 1-nerved, rigid, scabrid on the back, glabrous or hairy on the inner side, green in the middle, margins cartilaginous, rigidly ciliate; flowering glume somewhat distant, lanceolate, compressed from the back, subinvolute, about 10 mm long, herbaceous-chartaceous, glabrous or sparingly hairy on the upper (inner) side, smooth except at the nerves close to the tip, 5-nerved, awn up to more than 2 cm long; pales narrow, keels smooth or almost so, hairy on the upper (inner) side, sometimes also on the back above; anthers 1—2 mm long; grain adhering to the glume and pale. 2—4 $\frac{1}{2}$ mm long, deeply channelled; male or barren spikelets very similar to the bisexual, but glumes usually unequal, outer one reduced to a scabrid bristle and usually longer than the inner one (1—2 $\frac{1}{2}$ cm long) which is ciliate only on the inner side or not at all; flowering glume up to 18 mm long and like the pale usually more hairy than in the bisexual. — Flow. March to April.

M. ma. Abusir; Alexandria, Mandara, Abukir, not rare. — **M. p.** Rosetta in fields; Damietta on sandy places; El-Arish. — **N. d.** Tanta; Zaqaq. Kafr Dowar; Qalyûb; Cairo. — **N. v.** Siût; Minia; Luksor; Aswân. — **D. a. sept.** Mokattam; Wady Dugla near Helwan; Galala.

Local name: Abu stina (Forsk.) — Sha'ir-el-dib (Ehrenberg.).

A very widely spread weed of Mediterranean region.

81. (64.) **Elymus** Linn.

Spikelets 2—4 at the teeth of the rhachis, all sessile and fertile. 2— ∞ -flowered, or 1-flowered with a rudiment of a second. Glumes 2 to each spikelet, antero-lateral, forming an involucre at the base of the pair or cluster of spikelets. Glumes opposite the rhachis, the flowering ones concave, entire, mucous or aristate; pale membranous, 2-keeled, scabrous at the keels, truncate or 2-toothed as the tip. — Usually tall perennial or annual grasses, with flat or convolute often rigid leaf-blades and a terminal cylindric dense spike which is sometimes interrupted and usually covered with long awns.

Species about 20 enumerated, of North and South temperate regions.

184. **Elymus Delileanus** Schult. Mant. Plant. II (1824), p. 424. — Boiss. Fl. Or. V. p. 692. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 179 no. 1255. — *Elymus geniculatus* Del. Ill. Flor. d'Eg. tab. 139 not Cust. — Annual, tufted; culms geniculate-ascending 10—30 cm long. Leaves narrow-linear, rigid. Spike stiff, oblong, 2—5 cm long, 1.5—3 cm broad; axis brittle, bearded with white bristles;

spikelets twin, 2-ranked, 2-flowered, the neutral flower long pedicelled; glumes coriaceous, lanceolate-subulate, scabrous, tapering into an awn, equal to that of the flowering glume; flowering glume oblong-lanceolate, concave, 5-nerved, scabrous, tapering into a flattish awn, 2 cm long. — Flow. April to May.

M. ma. Mariut-Kinghi, old quarries Gaf Delfa, abundant. — Alexandria.

Also known from Cyrenaica Syria; Assyria and Persia.

10. Cyperaceae.

Grassy or rush-like herbs, usually perennial. Stems solid or rarely slightly hollow, often trigonous, sometimes compressed or terete. Leaves alternate, mostly radical, few or many, sometimes wanting or reduced to sheathing scales; sheaths closed, not split to the base. Flowers bisexual or unisexual, minute, solitary and sessile in the axils of small imbricated bracts (glumes), which are aggregated into few- or many-flowered (rarely 1-flowered) spikelets. Spikelets either solitary and terminal, or arranged in spikes, racemes, panicles or clusters. Glumes rigid or scarious or membranous, concave, distichous or imbricated all round, persistent or deciduous, 1 or 2 (rarely more) at the base of each spikelet empty. Perianth wanting or represented by few hypogynous bristles or scales. Stamens 1—3, rarely 4—6, hypogynous; filaments linear, flat, often elongating after flowering; anthers usually exserted from the spikelet and pendulous, linear, basifixed, 2-celled. Ovary entire, 1-celled, in *Carex* and its allies enclosed in a peculiar flask-shaped organ called the utricle or perigynium formed of 1 (or 2?) modified bracteoles; style short or long, 2—3-cleft, divisions stigmatic on the inner side; ovule solitary, basal, erect, anatropous. Fruit a small indehiscent nut (in *Carex* enclosed in the utricle), centicular or compressed or more often trigonous. Seed erect; testa membranous; albumen farinaceous; embryo minute, at the very base of the albumen.

A very large family, found in all parts of the world, both temperate and tropical, and in almost all stations, but most abundant in marshes, or by the margins of lakes and rivers. It is closely allied to grasses, being chiefly distinguished by the stiffer habit, solid and usually angled or compressed stems, entire leaf-sheaths, basifixed anthers, undivided (not plumose) stigmas, and by the position of the embryo. Genera 65; species estimated at 3400. Notwithstanding the extent of the order, it is of a little economic importance. The herbage is too coarse and harsh, and to deficient in nutritive properties, to be serviceable as food for cattle, and the

seed is useless. The tuberous roots of certain species of *Scirpus* and *Cyperus* contain starch, and have been used as food, while in others they are bitter, tonic and stimulating, and have been employed in medicine. Many species are serviceable for paper-making, or in the fabrication of mats, baskets, etc. The paper of the ancients was manufactured from the well-known *Papyrus*, a plant common along the Nile and in other parts of tropical Africa. The 6 genera found in Egypt are either cosmopolitan or very widely distributed.

- A. *Cypereae*. — Spikelets usually many-flowered, flat or compressed. Glumes distichous, imbricate, lower 1—2 empty. Flowers bisexual or the upper 1—2 male by arrest. Hypogynous bristles absent 1. *Cyperus*.
- B. *Scirpeae*. — Spikelets usually many-flowered, terete. Glumes spirally arranged, lower 1—2 empty. Flowers bisexual or the upper 1—2 male. Hypogynous bristles often present.
- I. Spikelets solitary, terminal. Nut crowned by the persistent thickened base of the style. Hypogynous bristles present 2. *Heleocharis*.
- II. Spikelets umbellata. Style bulbous at the base, usually deciduous. Hypogynous bristles wanting. Leaves radical 3. *Fimbristylis*.
- III. Spikelets few or many, fascicled or umbelled. Style not thickened at the base, continuous with the nut.
- a) Inflorescence paniculated sometimes reduced to 1 or 2 heads nearly 4. *Fuirena*.
- b) Inflorescence umbelled or in a head . . . 5. *Scirpus*.
- C. *Rhynchosporae*. — Spikelets 1- or few-flowered, terete or compressed. Glumes spirally arranged, several (usually more than 2) of the lower ones empty. Bisexual flowers 1 or 2; the remainder male or imperfect. Rhachilla often elongated and flexuose between the flowers. 6. *Schoenus*.
- D. *Cariceae*. — Flowers monoecious, the male and female flowers in the same or distinct spikelets; rarely dioecious. Nuts enclosed in an entire or 2-fid inflated sac, utricle; spikelets solitary, or more often clustered or spicate or panicled. Rhachilla not produced beyond the utricle . . . 7. *Carex*.

81. (1.) *Cyperus* Linn.

Spikelets oblong or linear, compressed; rhachilla persistent. Glumes usually many, distichous; the two lowest empty; four at least and generally many of the succeeding ones bisexual and fruit-bearing, falling away from the rhachilla one by one, commencing with the lowest; the uppermost 1—3 sterile or empty. Stamens 2—3, rarely 1. Style continuous with the ovary, not thickened at the base; branches 3, or 2, filiform. Nut triquetrous or plano-convex, the flat face against the rhachilla, surface smooth. — Annual or more commonly perennial herbs. Stems erect, simple below the inflorescence. Leaves at the base of the stem, usually long, the lowest sometimes reduced to sheaths. Inflorescence umbellate or capitate, often large and compound; bracts at the base long, leaf-like, spreading.

A large genus of over 300 species, most abundant in the tropical and subtropical districts of both hemispheres, comparatively rare in the temperate regions.

A. Style bifid. Achene more or less compressed.

Rhachis not winged.

I. Margin of the achene turned toward the rhachis of its spikelet.

- | | |
|--|-----------------------------|
| a) Stolons 0; stems tufted | 1. <i>C. polystachyus</i> . |
| b) Rhizome obliquely descending; stem solitary | 2. <i>C. Mundtii</i> . |

II. Face of the achene turned toward the rhachis of its spikelet.

- | | |
|---|------------------------------|
| a) Perennial; culms leafy only below. | |
| 1. Spikelets in a globular, lateral cluster | 3. <i>C. laevigatus</i> . |
| 2. Spikelets in oblong-cylindrical, dense spikes | 4. <i>C. alopecuroides</i> . |
| b) Annual; culms overtopped by linear, acuminate leaves | 5. <i>C. Michelianus</i> . |

B. Style trifid. Achene triquetrous.

I. Rhachis of the spikelet angled or margined, not winged.

- | | |
|---|------------------------------|
| a) Perennial; leaves glaucous. | |
| 1. Root-stock long creeping; clusters of spikelets sessile in dense spherical heads | 6. <i>C. capitatus</i> . |
| 2. Root-stock short, stoloniferous; spikelets crowded into a single globular head | 7. <i>C. conglomeratus</i> . |

b) Annual; leaves green.

1. Spikelets narrow linear, 0,5 cm long, not compressed.

α) Culms densely tufted, 10—30 cm high

8. *C. fuscus*.

β) Culms solitary 50 cm high

9. *C. difformis*.

2. Spikelets ovate lanceolate, 2 cm long, compressed

10. *C. compressus*.

II. Rhachis of the spikelets furnished with decurrent, membranous wings.

a) Underground stems without tubers.

1. Root-stock short, thickish; leaves as long as the culms

11. *C. auricomus*.

2. Root-stock stoloniferous; leaves $\frac{1}{2}$ the length of the culms

12. *C. articulatus*.

3. Root-stock long creeping; leaves nearly as long as the culms.

α) Glumes brownish with a white margin

13. *C. longus*.

β) Glumes brownish without a white margin

14. *C. badius*.

b) Underground stems with tubers.

1. Tubers ovate-oblong

15. *C. rotundus*.

2. Tubers globular.

α) Leaves of the involucre broad linear

16. *C. esculentus*.

β) Leaves of the involucre filiform

17. *C. bulbosus*.

185. (1.) ***Cyperus polystachyus*** R. Br. Prodr. Flor. Nov. Holl. (1810), p. 214. — Boiss. Fl. Or. V, p. 365. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 155 no. 1079. — *Pycnus polystachyus* P. Beauv. Fl. d'Oware II (1807), p. 48 tab. 86 fig. 2. — Glabrous; stems tufted, 16—50 cm long; leaves all close to the base of the stem, 20 cm long, 5 mm broad; spikes dense, of very many spikelets in compound (few or 1) heads; bracts 3—5, lowest 4—12 cm long, similar to the leaves; spikelets densely spicate, 1—1,5 cm long, 0,5 mm broad, linear compressed, yellow more or less brown-red-tinted, 20-nutted; glumes ovate boat-shaped, obtuse, closely imbricated even in fruit; style branches 2; nut oblong-ellipsoid, compressed, black, half of the length of the glume, closely and regularly marked by raised dots. — Flow. March to April.

O. Little Oasis, widely spread; Dakhel; Great Oasis.

Abundant in the most warm and temperate regions, except Europe.

186. (2.) **Cyperus Mundtii** (Nees) Kunth Enum. Plant. II (1837), p. 17. — Boiss. Fl. Or. V, p. 366. — C. B. Clarke in Journ. Linn. Soc. XX (1883), p. 281. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 155 no. 1080. — Sickenberg. Contrib. Fl. d'Eg., p. 298. — *Pycrus Mundtii* Nees in Linnaea IX (1834), p. 283. — Glabrous; rhizome obliquely descending, 2—12 cm long; stem solitary, 8—12 cm long, covered for often half its length by leaf-sheaths; leaves 6—10 long and 0.6—1 cm broad; umbel simple or compound or reduced to 1 head; bracts 3—8, lowest 2—8 cm long, similar to the leaves; rays few or many; spikes of 3—7 somewhat loosely-spicate spikelets, ebracteate; spikelets 1 cm long and 0.6 cm broad, compressed, linear, brown or chestnut-red or pale brown, 20-nutted; glumes ovate, boat-shaped, obtuse, somewhat inflated; style-branches 2; nut obovoid, compressed, biconvex, brown, scarcely half the length of the glume, closely and regularly marked by raised dots. — Flow. April.

O. Little Oasis; Dakhel; Kharge in the Great Oasis. Aïn Bamîz, not common.

Throughout Africa and the Mascarene Island, also in Spain.

187. (3.) **Cyperus laevigatus** Roemer Mant. Plant. (1771), p. 179. — Boiss. Fl. Or. V, p. 366. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 156 no. 1081. — *Cyperus laevigatus* var. *ramlehensis* Jouannet ex Sickenberg. Contrib. Fl. d'Eg., p. 298. — *Juncellus laevigatus* C. B. Clarke in Hook. fil. Flor. Brit. Ind. VI, p. 596. — *Cyperus lateralis* Forsk. Flor. aeg.-arab., p. 13. — Glabrous; rhizome creeping; stems 16—42 cm long, somewhat fleshy, roundish; leaves usually short, often hardly any, sometimes exceeding the stem, 3 to 4 mm broad, upper part terete-trigonus; spikelets 1—30, in one apparently lateral head; bracts 2, lower 2—6 cm long, suberect, similar to the leaves; spikelets 1 cm long, 0.5 cm broad, straw-coloured, often more or less purple-tinged, 12—24-flowered, compressed but thick; glumes very close-packed, broad-elliptic, obtuse, rounded on the back, falling seriatim from the base of the persistent rhachilla; stamens 3, anthers oblong, with a short lanceolate red crest; undivided part of style about as long as the nut; branches 2 as long as the nut; nut plano-convex, $\frac{1}{2}$ — $\frac{2}{3}$ the length of the glume, obovoid, obtuse, smooth, brown, plane posticous face pressed against the rhachilla, anterior face convex or somewhat ridged. — Flow. March to April.

M. ma. Alexandria, Tsheyl-el-akhteriye; Sidi Gaber, near running water, common; Ramle; Abukîr, often forming turfs. — **M. p.** Rosetta, mouth of the Nile, everywhere in great abundance; Damietta, bords of the Nile, abundant. — **N. d.** Alexandria, canal; Damanhûr; Er-Rahmâniya; Mehallet-el-Kebîr abundant; environs of

Cairo, not rare; El Menaïr. — **N. f.** Medînet-el-Fayûm, common on the edges of irrigation-canals; Senûris; Tomia, not rare. — **O.** Dakhel, in cultivated ground. Great Oasis, not rare. — Little Oasis. — **D. l.** Inundation ground near the Pyramids of Giza. — Bedrashên near Saqqâra, not rare; Wady Natrûn. — **D. i.** Imailia, in sandy places; Wady Tumilat in cultivated ground; Suez, in sandy places. — **D. a. sept.** Bir-Abu-Ballah, northern part of the Egyptian desert; Ayûm Mûsa near Suez. — **D. a. mer.** Qoseyr, not common.

— var. **pictus** (All.) Boeckeler Linnaea XXXV (1868), p. 494. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 156 no. 1081. — *Cyperus distachyus* All. Auct., p. 48 tab. 2 fig. 5. — Boiss. Fl. Or. V, p. 367. — 2—3 leaves at the base of the culm, the lowermost reduced to sheaths, the upper one ending in a linear limb; spikelets 2—5, sessile, in a lateral cluster, linear, flattened, often curved upward; nut ovate-elliptical, mucronulate, convex at the outer, flattish at the inner face, two thirds as long as the glume. — Flow. April.

M. ma. Alexandria, Mandara, not common; Ramle, Abukir in sandy places. — **M. p.** Damietta; Rosetta. — **N. d.** Ricefields near Mariut; Damanhûr, on bords of irrigations canals; Zaqaziq in cultivated ground; Cairo. — **O.** Dakhel: 'Ain Sherif; Great Oasis, in ricefields, common; 'Ain Taulil not rare. — **D. a. sept.** Suez. — **R.** Qoseyr.

Local name: Burbeyt.

Found in all warm and temperate climates.

188. (4.) **Cyperus alopecuroides** Rotth. Descr. et Icon. Plant. (1773), p. 38 tab. 8 fig. 2. — Boiss. Fl. Or. V, p. 367. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 156 no. 1082. — *Juncellus alopecuroides* C. B. Clarke Flor. Brit. Ind. VI. p. 595. — A large glabrous annual, 60—90 cm high. Leaves often as long as the stem, 1.27—2 cm long broad. Rays of the umbel 8—13 cm long; bracts 24—36 cm long, leaf like; raylets often 2.5 cm long, bearing at the apex 2—4 ebracteolate spikes. Spikes 2.5—3.5 cm long by 0.75 cm broad. Spikelets 1 cm long, lanceolate, compressed. Glumes muticous or mucronulate, concave, dirty straw-coloured, rhachilla rather stout subquadrangular not winged. Stamens 3; anthers muticous. Nuts plano-convex, small $\frac{1}{2}$ the length of the glume, finally ashy-black; style as long as the nut, branches longer, shortly exsert. — Flow. March to April.

N. d. Alexandria; Damanhûr, sides of irrigation canals; Rosetta; Kafr Dowar. — Mansura; Tanta, Qalyûb; Benha-el-'Asl; Sâlihiya; Cairo not rare. — **N. f.** Kafr-Mukfût, in ditches; Medînet-el-Fayûm; Senûris; Senhûr; Abuxa not rare. —

Local name: samâr helu; 'olub-es-sultân; dis; in the Fayûm generally: 'olûb.

Widely distributed throughout tropical Africa and Australia. In the Fayûm the plant is used in making mats.

189. (5.) **Cyperus pygmaeus** Rott. Descr. et Icon. Plant. (1773), p. 20 tab. 14 fig. 4 pro parte. — Boiss. Fl. Or. V, p. 368. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 156 no. 1083. — Sickenberg. Contrib. Fl. d'Eg., p. 299. — Juncellus pygmaeus C. B. Clarke in Flor. Brit. Ind. VI, p. 596. — A glabrous annual. Stems caespitose often very many, 2—25 cm long. Bracts 6—12 cm long, spreading; head 0.63—1 cm in diamet. Spikelets often 100, 0.63 cm long, 8—24-flowered, greenish-white, finally pale-brown. Glumes close-packed, boat-shaped. Stamens 2—1; anthers small, linear-oblong, muticous. Nut ellipsoid, plano-convex, $\frac{1}{3}$ — $\frac{1}{2}$ the length of the glume, brown, top pyramidal; style shorter than the nut; branches shortly exsert. — Flow. March to April.

N. d. Tanta; Zifta; Zaqaqiz; Benha-el-'Asal; Qalyûb; environs of Cairo, not rare. — **N. v.** Old Cairo, Bulaq; Siut, sides of the irrigations canals; Aswân, not common.

Local name: sammâr. —

— — var. **Eu-Michelianus** (Aschers. and Graebner) Schweinf. et Muschler comb. nov. — Cyperus Michelianus subsp. Eu-Michelianus Aschers. and Graebner Synops. mitt.-europ. Flora II, 2, p. 273. — Cyperus Michelianus Del. Ill. Flor. Aeg., p. 71. — Dichostylis pygmaea Nees Linnaea IX, p. 289. — Juncellus pygmaeus C. B. Clarke in Hook. fil. Fl. Brit. Ind. VI, p. 596 pro parte. — Boiss. Fl. Or. V, p. 367. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 156 no. 1083. — The rhacheola of ripe specimens shows the scars arranged spirally from the base of the spikelet, whilst in the type the scarce on the rhacheola are seen to be exactly distichous. — Flow. March.

M. ma. Alexandria; Sidi Gaber; Ramle, not common; Abukir in sandy places. — **N. d.** Tanta, edges of irrigation canals; Zifta; Zaqaqiz; Qalyub; Cairo not rare. — **O.** Little Oasis; Great Oasis; El-Kharge; Qasr-el-Goêta; 'Ain Tauil, not rare. — **R.** Qoseyr. —

Distributed in all warm regions except Europe.

190. (6.) **Cyperus capitatus** Vandelli Fasc. Plant. (1771), p. 5. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 156 no. 1084. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 66 no. 327. — C. aegyptiacus Glox. Obs. bot., p. 20 tab. 3. — C. schoenoides Griseb. Spic. Flor. Rumel. II, p. 411. — Boiss. Fl. Or. V, p. 368. — Scirpus Kalli Forsk. Flor. aeg.-arab., p. 15. — Perennial, glaucescent; root-stock long

creeping in the sand; culms terete, stout, erect or incurved, base enclosed with tawny sheaths and leaves. Leaves rigid, incurved, keel-grooved, as long as the culm or longer. Clusters of spikelets sessile in dense, spherical heads, 2—3.5 cm in diameter, bracts 3—4, unequal, dilated at the base, horizontal, many times as long as the head; spikelets ovate-oblong, compressed, scarcely 2-ranked; glumes chestnutbrown, ovate, keeled, many-nerved, mucronate, the lower 1—2 larger, sterile; nuts one-third as long as the glume. — Flow. March to April.

M. ma. Alexandria; Sidi Gaber; Mandara; Abukîr, everywhere in the deep sand of the coast. — **M. p.** Rosetta, in sandy places; Damietta, in the deep sand of the hills near the town.

Local name: sa'ad, 'eshûb.

Known from all parts of North Africa. •

191. (7.) **Cyperus conglomeratus** Rottb. Descr. et Icon. Plant. (1773), p. 21 tab. XV fig. 7. — Boiss. Fl. Or. V, p. 369. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 156 no. 1085. — *C. complanatus* Forsk. Flor. aeg.-arab., p. 14 no. 12. — Perennial, tufted, glaucescent; root-stocks short, stoloniferous, with fibres often wooly; culms teretish, rigid, leafy at the base. Leaves rigid, teretish, grooved below, as long as the culms or shorter. Spikelets crowded into a single globular head, 1—3 cm in diameter, or crowded at the tip of 3—4-rayed umbel, oblong to oblong-linear compressed, many-flowered; bracts 1—3, rigid, unequal, the longest continuing the culm, overtopping the inflorescence; glumes straw-coloured, ovate to ovate-oblong, keeled, obtuse or mucronulate, many-nerved; stamens 3. — Flow. March to April. —

M. p. Rosetta, in deep sand of the coast, common; Damietta, on sandy hills, not rare; Qatiya. — **N. d.** Damanhûr, bords of the Nile; Abu-Kebîr, not rare. Cairo, in sandy places. — **D. l.** Pyramids of Giza; Pyramids of Zâwiyet-el-'Aryân; Abusîr in sandy places. — **D. i.** Es-Salihiya, not rare on sandy hills; Ismailia; Suez, in deep sand, rare. — **D. a. sept.** Belbeys; Wady et Tih near Helwan; Wady Rished, rare; Serapeum. —

Local name: 'eshûb; se'êd (Ascherson, Muschler).

Widely spread from Egypt to British India.

— — **var. effusus** (Rottb.) Boiss. in Flor. Or. V (1884), p. 369. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 156 no. 1085. — *Cyperus effusus* Rottb. Descr., p. 22 tab. XII fig. 3. — *Cyperus falcatus* Boeckeler Linnaea XXXV, p. 341. — Spikelets linear compressed, 20—60-flowered; glumes most densely packed scarcely mucronate; varies

greatly in size, but all formes unlike the type in the exceeding closely packed glumes; the spikelets are not longer than in the type, but have twice as many flowers. — Flow. March to April.

R. Qoseyr; Râs Mreyk; Mirsa Wady Sekhuma.

Local name: 'eukkûb (Klunzinger, Schweinfurth).

192. (8.) **Cyperus fuscus** L. Spec. Plant. I (1763), p. 69. — Boiss. Fl. Or. V, p. 370. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 156 no. 1086. — *Cyperus ferrugineus* Forsk. Flor. aeg.-arab., p. 14. — *Cyperus Forskâlei* Dietr. Syn. Plant. II, p. 251. — Annual; root fibrous; culms tufted, 10—40 cm long, erect or diffuse, triquetrous, leafy below. Leaves linear, flat, somewhat shorter than the culm; inflorescence an unequally 3—7-rayed umbel, or a head; bracts 3—4, unequal, longer than the inflorescence, spikelets sessile or pedicelled at the end of the rays or in the head, 5 to 7 mm long, oblong-linear; glumes tawny, oblong-ovate, keeled, obtusish, mucronulate. — Flow. March.

M. p. Rosetta, in sandy places, not rare; Damietta, on sandy hills, rare. — **N. d.** Alexandria; edges of irrigation canals; Kafr Dowar; Fua; Cairo, not common, in fields. —

Widely spread throughout Africa, Asia and Europe.

— — var. **virescens** Vahl Enum. Plant. II (1806), p. 336. — *Cyperus virescens* Hoffmann Deutsch. Flor., p. 21. — *Cyperus fuscus* L. var. *protractus* Del. Fl. d'Eg., p. 8 tab. V, fig. 3. — *Cyperus protractus* Link. Enum. Plant. Hort. Berol. I, p. 45. — Glumes allover greenish. —

M. ma. Sidi Gaber, in sandy places.

Distributed like the type.

193. (9.) **Cyperus difformis** L. Amoen. Acad. IV (1759), p. 302. — Boiss. Fl. Or. V, p. 370. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 156 no. 1087. — *Cyperus complanatus* Forsk. Flor. aeg.-arab., p. 14. — Annual, middle-sized, glabrous. Stems 8—40 cm long, acutely triquetrous at the top. Leaves usually somewhat shorter than the stems, 3 mm broad, flaccid. Umbell usually contracted, rays up to 2—5 cm, sometimes much larger; bracts 4 to 20 cm long, the lowest often suberect (i. e. umbel lateral). Spikes 6 mm to 1 cm in diameter, globose. Spikelets 6—8 mm long, somewhat turgid, 10—30-flowered. Glumes close-packed, concave, very obtuse, straw-colored, sides more or less red. Stamen 1, rarely 2; anther small, oblong, muticous. Nut subsessile, subequally trigonous; pale brown; style much shorter than the nut, branches linear short. — Flow. April to May.

N. d. Alexandria, ricefields; Kafr Dowar; Damanhûr, everywhere in fields; Tell-el-Sanid; Qalyub, a weed in fields; Cairo, in gardens. — **N. f.** Medinet-el-Fayûm; Senûris; Senhûr; Tomia; Kafr Mukfut a weed in fields. Tâlit-el-haggar. — **N. v.** Beni-Suêf. Feshn; Siut; Ekhhim; Kene, rare; Dendera; Luksor; Aswân. — **O.** Dakhel; Great Oasis. —

Local name: 'aggîr; 'aggeyr; 'adjjîr (Schweinfurth).

Universal throughout the Old World in rice-fields.

194. (10.) **Cyperus compressus** L. Spec. Plant. I (1753), p. 68. — Boiss. Fl. Or. V, p. 372. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 156 no. 1088. — Glabrous. Stems caespitose, 8—32 cm long or smaller. Leaves often nearly as long as the stem, 3—6 mm broad; bracts often longer than the umbel, leaf-like. Umbell rays 2—12 cm long. Spikelets 2—2.5 cm long and 3—6 mm broad, 20—60-flowered. Glumes densely, not rigidly, imbricated, ovate, many-nerved, mucro scarcely recurved. Stamens 3; anthers linear-oblong, scarcely apiculate. Nut $\frac{1}{3}$ the length of the glume, very broad; style shorter than the nut, branches linear shortly exsert. — Flow. April.

M. p. Damietta, very rare.

Local name: serakôn. —

Widely distributed throughout all warm countries, except Australia.

195. (11.) **Cyperus auricomus** Sieb. ex Spreng. Syst. Veg. I (1825), p. 230. — Boiss. Fl. Or. V, p. 373. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 156 no. 1089. — *Cyperus ornithopodioides* Delile Fl. Aeg. Illustr. II, p. 50. — Glabrous, even the rhachis of the spikes. Stem tall, at the top triquetrous, 30—100 cm long. Leaves often as long as the stem, 1—1.5 cm broad. Umbel 16—50 cm in diameter, large, compound, rays divaricate; bracts usually longer than the umbel. Secondary umbels usually conspicuously bracteoid; spikes corymbose, shortly peduncled. Spikelets very many, linear, 6—40-flowered very variable in size, yellow golden, rufous or brown, wings of rhachilla lanceolate, soon deciduous. Glumes boat-shaped, ovate, scarcely mucronate; anthers linear-oblong scarcely crested. nut oblong-obovoid $\frac{1}{2}$ the length of the glume. — Flow. March to April.

N. d. Alexandria; Gabari; Mex; Damanhûr; near Mansûra; Zifta; Tanta; Benha-el-asl; Zaqaq; Qalyub; Cairo, rare; Wady Tumilat; Makhsama; Ramses; Gassatiû. — **N. f.** Medinet-el-Fayûm; Senhûr; Senûris; Tomia; El-Gharaq, not rare.

Local name: serakôn; dîs (Ascherson).

Widely spread throughout the Tropics.

— — var. **subalatus** (Boeckeler) Aschers. and Schweinf. Ill. Fl. d'Eg., p. 156 no. 1089. — *Cyperus subalatus* Boeckeler in Linnaea XXXVI, p. 291 nec Steud. — Boiss. Fl. Or. V, p. 374. — Glumes closely imbricate, ovate, acute, 5—7-nerved, hardly keeled; stamens 3; anthers linear-oblong, connective somewhat produced in a short triangle; nut hardly $\frac{3}{5}$ the length of the glume, triangular, oblong-ellipsoid, pyramidal-topped, pale-brown. Style as long as the nut, branches 3 linear, longish. — Flow. March. —

M. p. Rosetta, not common, on sandy hills; Damietta, in sandy places. — **N. d.** Menzale. — **N. f.** Bahr Jûsuf; Medinet-el-Fayûm; Senûris. —

Local name: qoreykh (Schweinf.) serakôn; dis (Aschers.).

Also known from other parts of North Africa.

196. (12.) **Cyperus articulatus** L. Spec. Plant. I (1753), p. 66. — Boiss. Fl. Or. V, p. 374. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 157 no. 1090. — *Cyperus niloticus* Forsk. Flor. aeg.-arab., p. 13. — Glabrous; stolons 3—4 mm in diameter, clothed by ovate-lanceolate striate brown-black scales, 1.5 cm long. Stem robust, terete, 90 cm to 1.80 m high, often 2—6 cm apart on the thick woody rhizome, at the top 3—6 mm in diameter, terete or scarcely trigonous, when dry usually with false nodes 1.5 cm apart; upper sheaths usually terminated by a subspathaceous lanceolate limb, rarely by a small green leaf. Umbel rays often 10, up to 4—8 cm; bracts 1.25 to 1.5 cm long, ovate, striate, subturgid at the base hardly keeled, concave, margins not reflexed. Spikes linear many-flowered; spikelets 5—15 together, shortly spicate, 6—8 cm long, 1—2 cm broad, 12—50-flowered; straw-coloured, afterwards dusky. Glumes even in fruit imbricate, ovate, obtuse, concave, scarcely keeled, obscurely 3—5-nerved on the back; wings of the rhachilla oblong or elliptic, scarious, ultimately deciduous. Stamens 3; anthers linear-oblong; mucous. Nut obovoid or oblong-ellipsoid, $\frac{3}{5}$ the length of the glume, trigonous, acute at either end, black; style shorter than the nut; branches linear, shortly exsert. — Flow. April. —

N. d. bords of the Mahmudiya Canal near Nusha's gardens at Alexandria; near the lake of Ramle; Damanhûr; Qalyûb; environs of Cairo; Ismailia.

Local name: qoreykh. —

Widely distributed throughout all warm regions.

197. (13.) **Cyperus longus** L. Spec. Plant. I (1753), p. 67. — Boiss. Fl. Or. V, p. 375. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 157 no. 1091. — Glabrous; rhizome somewhat thick, creeping, 3 or

2 mm in diameter, clothed by loose ovate triangular striated brown scales. Stem rather robust at the top subacutely trigonous, at the base oblique or decumbent, not nodosely thickened nor suddenly contracted into a wiry rhizome, 20 to 90 cm high. Leaves $\frac{1}{2}$ to $\frac{3}{4}$ the length of the stem 0.6 cm broad. Umbel rays 3—10, 2 to 20 cm long; spikelets shortly spicate linear-oblong, 6—16-flowered, 1 cm long, 3 mm broad, slightly compressed, greenish ferruginous or chestnut-red. Glumes ovate, obtuse, hardly keeled, 5—7-nerved, back green, margins narrowly scarious. Stamens 3; anthers linear-oblong, muticous or scarcely apiculate. Wings of the rhachilla elliptic, hyaline, persistent; nut ellipsoid, $\frac{1}{2}$ to $\frac{1}{3}$ the length of the glume, trigonous, black, the style shorter than the nut, branches linear shortly exsert. — Flow. March to April.

N. d. Tanta, on the edges of irrigation canals; Zaqaзиq; Qalyub; environs of Cairo, common. — **N. f.** Medinet-el-Fayûm; Senûris; Senhûr; Tomia, not rare; Abuxa, common. — **N. v.** Beni-Suêf; Siut, sides of irrigation canals; Abu-Fêda; Luksor; Aswân. —

Local name: sa'ad (Schweinf.-Muschler).

Widely distributed eastward to British India.

198. (14.) **Cyperus badius** Desf. Flor. Atlant. I (1798), p. 45. — Boiss. Fl. Or. V, p. 376. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 157 no. 1092. — *Cyperus brachystachys* Presl. Cyp. et Gram. Sic., p. 15. — Like *C. longus* L., but the umbel less straggling, with less unequal rays; spikes denser; spikelets neater, more brightly coloured, more brown or chestnut. — Flow. March to April.

N. d. Alexandria; Damietta; Menzale; Tanta, common on the sides of irrigation canals; Qalyub; Cairo, common. — **N. f.** Medinet-el-Fayûm, edges of canals; Senûris; Tomia; El-Wady, rare; Tirsâ. — **N. v.** Abu Girga; Minia; Beni-Hassan; Ekhmin; Dendera; Kene; Luksor; Aswân; islands of the Nile.

Local name: sa'ad.

The southern form of *Cyperus longus*, also known from Europe, North Africa and West Asia.

199. (15.) **Cyperus rotundus** L. Spec. Plant. I (1753), p. 67. — Boiss. Fl. Or. V, p. 376. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 157 no. 1094. — Sickenberg. Contrib. Fl. d'Eg., p. 299. — Glabrous; rhizome woody, creeping, with tuberous thickenings; stem 8—42 cm long, erect at the base, trigonous at the top, smooth; leaves $\frac{2}{3}$ the length of the stem, $\frac{1}{2}$ — $\frac{2}{3}$ cm broad; umbel 2—18 cm diam., compound, simple, or of one spike; bracts 3—4, overtopping the umbel; spikelets spicate, 1 cm long, 0.4—0.5 cm broad, much

compressed, 12—24-flowered, chestnut-red; rachilla scarious-winged; glumes boatshaped, ovate, pointed, 1—3 nerves forming the keel; stamens 3; anthers linear, not crested; nut $\frac{1}{2}$ the length of the glume, trigonous, obovoid, dark-brown; style shorter than the nut, branches 3 linear, longish. — Flow. March to April.

M. ma. Alexandria, edges of canals; Sidi Gaber, Ramle not rare; Abukîr, sandy places. — **M. p.** Damietta; El-'Arîsh. — **N. d.** Fua; Damanhûr; Shirbîn; Mansura; Tanta; Zifta; Zaqaqîq; Qalyub; Cairo. — **N. f.** Banks of the bahr el Gharaq; bords of bahr Yûsuf. Medînet-el-Fayûm; Tomîa. — **N. v.** Beni-Hassan; Abnub; Siut; Ekhmîm; Kene; Karnak; Luksor; Aswân. — **O.** Great Oasis: El-Kharge; 'Ain-Tauîl; Gaina; Sheykh Khalid Ibn-el-Welîd; Dakhel. — **D. l.** Abu Roash near Cairo; Pyramids of Gîza; Pyramids of Zawiyet-el-'Aryân, not rare. — **D. a. mer.** Wady Dugla; Wady Hof; Wady Rîshed near Helwan; Atfîh; Dêr Byâd. — **D. a. sept.** Gebel Silsele.

Local name: negîl (Forskâl.); dîs; sa'ad-el-homâr; sibl-el-mâ'iz; burbeyt; generally sa'ad.

Widely distributed in all tropical and warm temperate regions — a rice field pest.

— var. **macrostachyus** Boiss. in Flor. Or. V (1884), p. 377. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 157 no. 1094. — Sickenberg. Contrib. Fl. d'Eg., p. 299. — *Cyperus tetrastachys* Desf. Flor. Atlant. I tab. 8. — Spikelets elongated up to 2—3 cm long. — Flow. April.

N. v. Minia, rare.

Also known from Syria and Mesopotamia.

200. (16.) **Cyperus esculentus** L. Spec. Plant. I (1753), p. 67. — Boiss. Fl. Or. V, p. 377. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 157 no. 1095. — *C. melanorrhizus* Delile Fl. Aeg. Illustr., p. 50. — Scarcely thickened; underground stems elongated, filiform, with globular tubers; culm erect, triquetrous, leafy at the base. Leaves linear, usually as long as the stem. Umbel compound, rays numerous, unequal, the longer often branching; bracts broad-linear, acuminate, longer than the rays; spikelets spreading, arranged in clustered spikes, oblong to linear, 5 mm to 1 cm long; glumes loosely imbricated, ovate-oblong, obtuse, straw coloured, with a narrow-green keel, many-nerved. — Flow. April.

N. d. Alexandria; Rosetta; Damietta; Damanhûr; Shirbîn; Mansura; Zaqaqîq; Cairo, common. — **N. f.** Banks of the bahr Yûsuf, common; Medînet-el-Fayûm; Senûris; Tomîa. — **N. v.** Siut, edges of irrigation canals; Kene; Karnak; Luksor; Aswân, not rare. — **O.** Little and Great Oasis.

Local name: of the wild plant: habb-el-'aziz es-sogheyyer; el-aswad (Delile). — sa'ad (Schweinf.-Muschler); of the cultivated plant: habb-el-'aziza.

Also known from South Europe, Africa and America.

201. (17.) **Cyperus bulbosus** Vahl Enum. Plant. II (1806), p. 342. — Boiss. Fl. Or. V, p. 377. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 157 no. 1096. — Glabrous; coat of the edible bulbs striated black splitting into elliptic very acute segments; stolons 1—5 cm long, thread-like. Stems 8—25 cm long, slender. Leaves overtopping the stem, narrow flagellate, numerous, subbasal, up to 3 mm broad, the tip long-caudate. Umbel contracted corymbiform, lowest ray somewhat distant; bracts overtopping the inflorescence, similar to the leaves. Spikelets 3—20, reddish, up to 1 cm long, 0,2 cm broad, 8—26-flowered; wings of the rhachilla elliptic, persistent. Glumes boat-shaped, ovate, obtuse, 11-nerved. Stamens 3; anthers linear, muticous. Nut obovoid, obtuse, triquetrous, black, hardly $\frac{1}{2}$ the length of the glume; style shorter than the nut, branches linear, somewhat long. — In the absence of roots this species can generally be discerned by the imperfection of the umbel, i. e. the lowest bract with its ray a little distant. — Flow. March to April.

N. d. Damietta, very rare.

Widely spread throughout all the warm regions.

82. (2.) **Heleocharis** R. Br.

Spikelet of many spirally imbricate glumes; lowest 1 or 2 empty, shorter than the spikelet, many succeeding glumes supporting bisexual flowers, perfecting nuts, uppermost male or sterile. Stamens 3 or 2, anterior. Style glabrous; base much thickened, distinguishable from the tip of the nut, but persistent; branches 3—2. Nut triangular, or flat (dorsally compressed). — Glabrous herbs; stem with one terminal spikelet (not rarely proliferous at the base); frondous leaves 0; uppermost sheath truncate or very shortly produced on one side; hypogynous bristles usually present, 7—3 in number, scabrous representing the sepals, petals and posticous stamens.

A genus of about 120 species, scattered over nearly the whole world; prevalent (85 species) in America.

- A. Spikelets oblong-lanceolate, 1—1,5 cm long; bristles as long as the nut 1. **E. palustris.**
- B. Spikelets oblong-ovate, 3,5 mm long, bristles $\frac{1}{3}$ longer than the nut 2. **E. caduca.**

202. (1.) **Heleocharis palustris** (L.) R. Br. Prodr. Flor. Nov. Holl. (1810), p. 224. — Boss. Fl. Or. V, p. 386. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 158 no. 1105. — *Scirpus palustris* L. Spec. Plant. I, p. 70. — Stems 8—40 cm long, on a creeping rhizome, usually distant, terete; spikelet 3—5 mm long, 2 mm broad, subcylindric, dense; glumes obtuse, without a keel, brown or chestnut, with scarious margins; bristles 6 or often fewer, as long as the nut; style-branches 2, longish; nut small obovoid, dorsally compressed, smooth, yellow or brown; style-base ovoid or conic $\frac{1}{3}$ to $\frac{1}{2}$ the length of the nut. — Flow. March to April.

N. d. Alexandria; Kafr-ez-Zayyât, not rare; Qalyub environs of Cairo, in ditches and on the sides of irrigation canals; Zaqaziq; Giza. — **N. f.** Abadiya Mahmud Bey near the bahr el Wady; near Kafr Shekh Abd-el-Kadr; Sersene, Elgig. — **N. v.** Siut, in fields often as a weed; Kene, bords of the Nile; Karnak; Luksor; Aswân. — **O.** Little Oasis; Oasis Dakhel in rice-fields.

Local name: burbeyt.

Distributed throughout the World except Australia; rare in tropical regions.

203. (2.) **Heleocharis caduca** (Delile) Schult. Mant. Plant. II (1824), p. 88. — Boiss. Fl. Or. V, p. 388. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 158 no. 1105. — *Scirpus caducus* Delile Fl. d'Eg., p. 9 tab. 6 fig. 2. — Perennial, dense caespitose; stems slender, up to 20 cm high, on a creeping rhizome, usually distant, terete; spikelet 3 to 5 mm long, 2—3 mm broad, oblong-ovate to ovate, dense; glumes oblong-lanceolate or lanceolate, obtuse pale-brown or yellow, without a keel, with scarious margins; bristles $5-6\frac{1}{3}$ longer than the nut; stigmas 2; nut compressed, obovoid, smooth, black; style-basis oblong or conic $\frac{1}{2}$ the length of the nut. — Flow. March.

N. d. Damietta, in great abundance in fields; north-east of Damietta, common in fields. — **O.** Great Oasis: El-Kharge, abundant.

Local name: qarn-el-khiliq.

Also known from Italy and its great islands.

83. (3.) **Fimbristylis** Vahl.

Spikelet of many glumes spirally imbricate, or sometimes subdistichous, lowest 1 or 2 empty, many or several succeeding glumes supporting bisexual flowers, perfecting nuts, uppermost male or sterile. Hypogynous bristles 0. Stamens 3 or 2, anterior. Style often more or less hairy, deciduous with its bulbous or little enlarged base; branches 3 or 2. Nut triangular, or flat, dorsally compressed.

— Stolons 0; leaves all near the base of the stem; inflorescence a terminal umbel, simple or compound, or a single terminal spikelet.

Species about 130, distributed over the tropical and warm-temperate parts of the World, especially abundant in the tropics of S. E. Asia and of Australia. — This genus differs from *Scirpus* (Sect. *Isolepis* R. Br.) only by the style being articulated at the base, the transverse line separating it from the tip of the nut being visible even in the young stage. —

A. Nut ribbed; spikelets with many angles 1. *F. dichotoma*.

B. Nut smooth; glumes puberulous on the back . . 2. *F. ferruginea*.

204. (1.) **Fimbristylis dichotoma** (Rottb.) Vahl Enum. Plant. II (1806), p. 287. — Boiss. Fl. Or. V, p. 389. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 158 no. 1108. — *Scirpus dichotomus* L. Spec. Plant. ed. II, p. 74. — *Scirpus bisumbellatus* Forsk. Flor. aeg.-arab., p. 15. — Annual, puberulous or minutely pubescent; stem 4—16 cm long; leaves often as long as the stem, 1.5 mm broad; umbel usually compound or decomposed; bracts 3—4, often as long as the umbel, similar to the leaves; spikelets all pedicelled, 2 mm long, 1 mm broad, dense; glumes boat-shaped, ovate, acute 3—1-nerved; stamens 2—1, or sometimes 3 (according to Boeckeler); style nearly always hairy, branches 2, shortish; nut $\frac{1}{3}$ the length of the glume, obovoid, biconvex, pale or scarcely brown, with 5—9 ribs on each face due to the cells being vertically superposed. — Flow. March. —

M. ma. Alexandria. — **N. d.** Alexandria; Rosetta; Sâlihiya; Damanhûr, not common; Tanta; Zaqaziq; Benha-el-'asl; Cairo, not rare. — **N. v.** Siut; Minia; Kene; Aswân.

Ranges from Portugal and West Africa to Hong Kong and New South Wales.

— var. **adventicia** (Ces.) Aschers. and Schweinf. Ill. Fl. d'Eg. (1887), p. 158 no. 1108. — *Fimbristylis adventicia* Cesati in Linnaea XXXI (1863), p. 261 tab. 2. — *Fimbristylis dichotoma* Vahl var. *macrostachya* Boeckeler in Linnaea XXXVII (1871), p. 13. — Spikelets linear-oblong, acute, 4 mm long; glumes mucronate. — Flow. April.

N. d. Lake of Makhsama.

Also known from Italy.

205. (2.) **Fimbristylis ferruginea** (L.) Vahl Enum. Plant. II (1806), p. 291. — Boiss. Fl. Or. V, p. 388. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 158 no. 1107. — Sickenberg. Contrib. Fl. d'Eg., p. 299. — Delile Fl. d'Eg., p. 10 tab. 6 fig. 3. — *Scirpus ferruginea* L. Spec. Plant. I, p. 74. — Biennial; stems closely caespitose on a very short, or obsolete rhizome, 16—60 cm long; leaves short, 8—16 cm long, or hardly any, hairy or glabrate, 2 mm broad or usually less;

umbel compound or simple, usually of 5—15 pedicelled spikelets, sometimes of one spikelet; bracts 3—2, usually short, occasionally as long as the umbel; spikelets 1.5 cm long and 3—4 mm broad, ovoid, rusty-brown; glumes round-backed, ovate, nearly always minutely pubescent in the upper half of the back; stamens 3—2; style longer than the nut, hairy, branches 2, rather short; nut scarcely $\frac{1}{2}$ the length of the glume, biconvex, obovoid, smooth, pale brown, not, or very obscurely longitudinally ribbed. — Flow. April.

N. f. Biahmu, rare, sides of irrigation canals; Senûris; Senhûr, very rare. — **O.** Little Oasis; Dakhel; Great Oasis.

All tropical and warm-temperate regions.

84. *Fuirena* Rottb.

Spikelets of many imbricate glumes, the lowest two empty, many succeeding glumes bisexual, perfecting nuts, aristate, hairy, uppermost male or sterile. Hypogynous bristles 6, 3 outer (sepals) small linear or 0; 3 inner (petals) obovate, often irregular or small or setaceous or 0. Stamens 3 anterior. Style glabrous, linear, not dilated at the base; branches 3, long. Nut sessile, obovoid, trigonous, often enclosed by the 3 persistent petals. — Rhizome (in the Egyptian species) woody, horizontal; stems with nodes and leaves throughout their length; inflorescence paniculate, not umbellate. The very hairy aristate flowers glumes and stems leafy upwards make this genus easy to distinguish even when the characteristic „petals“ fail or are like the bristles of *Scirpus*.

A small genus of about 25 species; in all warm countries, very alike in general appearance.

206. *Fuirena pubescens* Kunth Enumer. II (1837), p. 132. — Boeck. in *Linnaea* 37, p. 104 partly. — *Scirpus pubescens* Lam. *Illustr.* I, p. 139. — *Carex pubescens* Poir. *Voy. en Barb.* 2, p. 317. — *Isolepis pubescens* Roem and Schultes *Syst. Nat.* I, p. 140. — More or less hairy; stems 8—30 cm long, triquetrous; leaves 5—10 cm long, 0.5—1.5 cm long; inflorescence of 4—20 spikelets, dull or somewhat glaucous green-brown, usually in 2 or 3 loose subterminal spikes, but a long peduncled axillary spike is sometimes added; spikelets 2 cm long, 0.5 cm broad, dense, prominently hairy and hispid by the soft excurrent points of the glumes; glumes frequently appearing spirally 4—5-ranked; anthers linear-oblong, hardly crested; hypogynous bristles 0, or minute, rudimentary, irregular; nut hardly $\frac{2}{5}$ the length of the glume, triquetrous, opaque white, very smooth, with a short microscopically scabrid cone at the top; outermost cells very minute, rectangular, so that the nut bears small nearly round reticulations, which in this species are exceedingly obscure in the

ripe nut; style about $\frac{1}{2}$ the length of the nut, branches 3, linear, much longer than the style. — Flow. March to April.

N. d. Swampy grounds near Alexandria, South of the Mahmudiya-Canal. (Collected by Prof. G. Schweinfurth, 1911.)

Also known from Abyssinia, Angola, Mozambique, South Africa and India.

85. (5.) *Scirpus* Linn.

Spikelets usually many-flowered (lower glumes spirally imbricated) sometimes few-flowered (lower glumes subdistichous upper spirally imbricated). Glumes 1—2 (rarely 3) lowest empty, several (rarely 1) succeeding with perfect not bearing flowers, upper tabescent. Hypogynous bristles 7—1, setaceous, or 0, or (*S. litoralis*) sometimes broad ovate. Stamens 3—1, anterior; anthers linear-oblong or oblong, crested or unappendaged. Style long or short, glabrous-3-fid or 2-fid, base linear or linear-conic, continuous with the tip of the nut. Nut trigonous or plano-convex, sessile or nearly so. — Herbs of very various habit, all glabrous (or the inflorescence slightly hairy).

Species about 130, very generally distributed in all climates and countries.

A. *Baeothryon*. Spikelets 1 solitary terminal;
bracts shorter than the spikelet 1. *S. parvulus*.

B. *Euscirpus*. Spikelets in one head or the heads
umbellate.

I. Inflorescence appearing lateral, the bract
or the largest of them erect, forming the
continuation of the culm.

a) Hypogynous bristles 0 2. *S. Holoschoenus*.

b) Hypogynous bristles present.

1. Hypogynous bristles rudimentary.

a) Head solitary, appearing lateral.

† Spikelets few 3. *S. supinus*.

†† Spikelets many 4. *S. articulatus*.

β) Heads several, corymbose, or one

compound 5. *S. corymbosus*.

2. Hypogynous bristles $\frac{1}{2}$ as long as
the nut.

a) Stem triquetrous.

† Glumes notched, style-bran-
ches 2 6. *S. triqueter*.

†† Glumes entire, mucronate
style-branches 3 7. *S. mucronatus*.

β) Stem terete or trigonous 8. *S. litoralis*.

II. Inflorescence terminal, cymose umbelled . 9. *S. maritimus*.

207. (1.) **Scirpus parvulus** Roem. et Schult. System. II (1817), p. 124. — Boiss. Fl. Or. V, p. 379. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 157 no. 1097. — *S. pollicaris* Del. Fl. Aeg. Ill., p. 50 no. 47 and Fl. d'Eg., Tab. LXIII (ined.) Fig. X. — Densely caespitose; roots fibrous, but stolons sometimes added. Stems 4—6 cm long, leafy only near the base, filiforme, geniculate or erect; uppermost sheath truncate, often marked by a brown transverse line, sometimes apiculate on one side. Spikelet 2—3 mm long, subbracteate, ovate-oblong, few-flowered. Glumes ovate-obtuse, flaccid, muticous, dusky chestnut. Bristles about as long as the nut, retrorse-scabrous, straw-coloured. Nut $\frac{1}{2}$ as long as the glume; style-base narrowly pyramidal, continuous with the nut; outermost cells of the nut small, sub-hexagonal, withering. — Flow. March to April.

N. d. Damietta, in rice-fields; El-Esbe, not common.

Local name: sha'r-el-qird.

Also known from Europe, Asia and America.

208. (2.) **S. Holoschoenus** L. Spec. Plant. I (1753), p. 72. — Boiss. Fl. Or. V, p. 381. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 157 no. 1101. — Rhizome horizontal, woody, covered by ovate chest nut scales. Fibrous roots thick, often (when growing in sand) woody. Stems rather stout, 16—60 cm high, approximate, terete. Leaves all near the base of the stem, sometimes 8—10 cm long, usually shorter, or reduced almost to sheaths. Umbel lateral (rarely reduced to a single head) of distant dense globe of numerous small spikelets; lowest bract sometimes 4—10 cm long, sometimes 3 mm to 2 cm long. Spikelets scarcely 6 mm long, ellipsoid, dense-flowered. Glumes ovate, keel subexcurrent, the tip hairy, rarely glabrous; stamens 3; anthers red-crested; style 3-fid; nut trigonous obovoid smooth minutely reticulate leaden-black, small, as long as $\frac{1}{2}$ — $\frac{2}{3}$ the glume, sub-triquetrous; outermost cells minute, quadrate-hexagonal, obscure withering. — Flow. March.

M. ma. Alexandria.

Also found in the other parts of Northern Africa.

— var. **australis** Koch Syn. Flor. germanic. (1837), p. 743. — *Scirpus australis* L. Syst. Veg., p. 85. — Sickenberg. Contr. Flor. d'Eg., p. 299. — Lower, Inflorescence simple, heads smaller, sometimes only one. — Flow. March.

D. i. Wady-el-Aris. — **D. a. sept.** Wady Qattar.

Also found in Europe and Asia.

209. (3.) **Scirpus supinus** (R. Br.) L. Spec. Plant. I (1753), p. 73. — var. **uninodis** (Del.) Aschers.-Schweinf. Ill. Fl. d'Eg., p. 157

no. 1098. — *Scirpus supinus* var. *digynus* Boiss. Fl. Or. V, p. 380. — *Isolepis uninodis* Del. Ill. Fl. d'Eg., p. 132 tab. VI fig. 1. — *S. lateralis* Forsk. Fl. aeg.-arab., p. 15. — Glabrous, annual; stems tufted; 2 to 12 cm long, terete, with one lateral head of 3—1 spikelets; leaves 2—4 cm long, linear; bracts 1—2, lower erect 2—8 cm long, as though a continuation of the stem; spikelets 6 mm long, 2 mm broad, 6—9-flowered, straw-coloured; glumes boat-shaped, ovate, subacute with a green keel; hypogynous bristles 0, or rudimentary; stamens 3; anthers linear-oblong, hardly crested; nut nearly $\frac{1}{2}$ the length of the glume, broadly obovoid or orbicular, biconvex trigonous, with transverse wavy lines, pale, ultimately black; style linear, nearly as long as the nut, branches 2 longer than the style. — Flow. March to April.

M. ma. Mariut. — **N. d.** Damietta. — **O.** Little Oasis; Dakhel. The variety is only known from Egypt.

— var. **minimus** (Hochst. et Steud.) Boiss. Flor. Or. V (1884), p. 380. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 158 no. 1100. — Lower culms only 2—4 cm high. — Flow. April.

N. d. in ditches near Sheykh el Gibrâni, near Abu Zabel. Only known from Egypt.

210. (4.) **Scirpus articulatus** L. Spec. Plant. I (1753), p. 70. — Boiss. Fl. Or. V, p. 381. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 157 no. 1090. — Sickenberg. Contrib. Fl. d'Eg., p. 299. — Glabrous, annual; stems tufted, 8—22 cm long, terete, usually pseudoseptate when dry, with one lateral dense head of 4—20 pale-brown spikelets; leaves hardly any; bracts 2, lower 12—24 cm long, as though a continuation of the stem; spikelets 1.2 cm long, 3 mm broad, very obtuse; glumes nearly hemispheric, neither pointed nor keeled; hypogynous bristles 0; stamens 3; anthers oblong-linear, not crested; nut less than $\frac{1}{2}$ the length of the glume, ovoid, subequally triquetrous, nearly black, strongly transversely wrinkled; style nearly as long as the nut, branches 3. — Flow. April.

N. d. Damietta; Tanta; Zaqaq. — **N. f.** Medinet-el-Fayûm. — **O.** Little Oasis.

Also in Tropical Africa, the Mascarene Islands, India, Malaya and North Australia.

211. (5.) **Scirpus corymbosus** Heyne Mssr. ex Roth Nov. Plant. Spec. (1821), p. 28. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 157 no. 1099. — *Scirpus inclinatus* Aschers. et Schweinf. in Boiss. Fl. Or. V, p. 381. — *Isolepis inclinata* Del. Ill. Fl. d'Eg., p. 50. — *Isolepis corymbosus* Schult. Mant. II, p. 65. — Rhizome 4—8 cm

long, horizontal; stems stout, terete, leafless, approximate, about 90 cm long, at the base 6 mm in diameter; spikelets clustered on rays of a lateral umbel; umbel simple or compound, rays usually short, sometimes 8 cm long; lowest bract 1—3 cm long, suberect, hardly simulating a continuation of the stem; spikelets 1—1.5 cm long, rusty; glumes ovate-acute, mucronate, faintly striate, glabrous, not notched at the top; nut obovoid, trigonous, black, smooth or with faint transverse lines, scarcely $\frac{1}{2}$ as long as the glume, pyramidal at the tip. — Flow. April.

N. d. Tanta; Mansura, on the edges of irrigation canals; Zaqaziq; Abu Hammâd. — **N. f.** Medinet-el-Fayûm; Talit-el-hagar.

Also in Tropical Africa, the Mascarene Islands, and India.

212. (6.) **Scirpus triqueter** L. Mant. Plant. I (1767), p. 29. — Boiss. Fl. Or. V, p. 383. — Sickenberg. Contrib. Fl. d'Eg., p. 299. — Glabrous, stoloniferous; stem 20—60 cm long, nearly leafless, triquetrous at the top, with 1 lateral head, or a simple umbel of heads; lowest bract as though a continuation of the stem, triquetrous, 2—6 cm long, acute; spikelets 3—10, up to 1 cm long, 6 mm broad, cylindric, obtuse, brown; glumes ovate, scarious at the tip, notched, with a minute bristle in the notch; hypogynous bristles 3—4 (or 6), often overtopping the nut, dark brown, obscurely scabrous; stamens 3; anthers linear-oblong, not crested; nut more than $\frac{1}{2}$ the length of the glume, obovoid, much dorsally compressed, pale, finally brown, smooth; style shorter than the nut, branches 2 long, sparingly papillose, slightly fusiform. — Flow. March to April.

D. i. Maritime Canal of Suez (the locality not exactly known).

Also known from Europe and Asia.

213. (7.) **Scirpus mucronatus** L. Spec. Plant. I (1753), p. 73. — Boiss. Fl. Or. V, p. 382. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 158 no. 1102. — Delile Fl. d'Eg., p. 14 tab. VII fig. 3. — Perennial, 60 to 80 cm high; root fibrous; culms thick, clustered, triquetrous, the base with leafless, obliquely truncate sheaths. Spikelets 10—20, oblong, sessile, closely crowded into a lateral, spherical head, 2 cm in diameter, long-overtopped by the triquetrous, at the length deflexed, continuation of the culm; glumes longitudinally striate, buff-coloured, ovate, concave, obtuse, mucronate, entire. Nut transversely wrinkled, mucronulate. — Flow. April.

N. d. Rosetta, rare.

Also known from Europe, Asia, Malaya, Australia and Polynesia.

214. (8.) **Scirpus litoralis** Schrad. Flor. germanic. I (1806), p. 142 tab. V fig. 7. — Boiss. Fl. Or. V, p. 383. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 158 no. 1103. — *Scirpus fimbrisetus* Del. Ill. Fl.

d'Eg., p. 11 tab. VII fig. 1. — *Scirpus aegyptiacus* Decsne. Ann. scienc. nat. ser. 2. IV, p. 196. — Glabrous except the glumes; rhizome horizontal; stems 20—80 cm long, trigonous at the top; leaves short or 0; lowest bract as though a continuation of the stem. 2—6 cm long; umbel lateral, usually compound; spikelets solitary. 1 cm long, 3—4 mm broad, pale brown; glumes ovate, tip notched thinly ciliate with often a small mucro in the notch; hypogynous bristles 4—7, as long as the nut, pale brown, ribben-like or almost petaloid, feathery by reason of many multicellular hairs; stamens 3; anthers linear-oblong, crested; nut $\frac{1}{2}$ as long as the glume, obovoid, much dorsally compressed, smooth, pale or finally brown; style linear, nearly as long as the nut, branches 2 longer than the style. — Flow. March to April.

M. ma. Alexandria; Sidi-Gaber, often in brackish water; Mandara: Abukîr, common. — **M. p.** Banks of the Lake Menzale, everywhere; Damietta, forming a turf on the sides of the irrigation canals. — **N. d.** Rice-fields near Alexandria and Damietta; Rosetta; Cairo, near the Great Petrified Forest; Massara in ditches near the station. — **N. f.** Medinet-el-Fayûm, common in ditches; East Island in the Birket-el-Qurûn. — **O.** Little Oasis: Ditches near Bauiti; Great Oasis: El-Kharge; Sheykh Khâiid Ibn el Welid. — **D. a. sept.** Suez, common; Lake Timsah near Ismailia.

Local name: sammâr (Ascherson-Muschler).

Throughout the warmer parts of the Old World, from the Atlantic to New Caledonia.

215. (9.) **Scirpus maritimus** L. Spec. Plant. I (1753), p. 74. — Boiss. Fl. Or. V, p. 384. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 158 no. 1104. — *Scirpus corymbosus* Forsk. Flor. aeg.-arab., p. 114. — Glabrous except the glumes; rhizome horizontal; stems 30—100 cm long, terete or somewhat trigonous at the top, usually leafless; lowest bract as though a continuation of the stem. 2—6 cm long; inflorescence lateral, umbel simple or compound; spikelets clustered or solitary, 1 cm long, 3—4 mm broad, brown; glumes ovate, concave, keeled, top scarious, emarginate, minutely hairy, with often a minute point in the notch; hypogynous bristles 6—5, as long as the nut, retrorsely scabrous, often reduced, irregular, rarely 0; stamens 3; anthers linear-oblong, hardly crested; nut more than $\frac{1}{2}$ the length of the glume, obovoid, dorsally compressed, smooth, pale, finally brown; style nearly as long as the nut, branches 3 or 2 as long as the style. — Flow. April.

M. ma. Mariut; Alexandria, along the canal common; Ramle; Sidi Gaber; Mandara; Abukîr, everywhere. — **N. d.** Tanta; Zaqaqiq,

common on the edges of the irrigation canals; Sâlihîya; Qalyub; Cairo. — **N. f.** Medinet-el-Fayûm, in ditches; Elgig, Birket-el-qurun; Senûris; Senhûr; Tomia; Kafr Mukfût. — **N. v.** Beni-Suêf; Feshn, not common; Minia; Siut; Ekhmîm; Kene; Luksor. — **O.** Little Oasis; Farâfra; Dakhel; Great Oasis.

Local name: debshe (Forsk.).

Found in nearly all warm and temperate regions, except South America.

86. (6.) **Schoenus** Linn.

Spikelet of few (or not very many) glumes, lowest few (or several) empty; 1—3 succeeding bisexual, nut-bearing, distichous (or nearly so), distant on the axis of the spikelet; upper glumes close together, male or empty; the part of the axis bearing the fertile glumes is elongated, flexuose, so that the lowest nut stands in an excavation or deep bend of it. Hypogynous bristles various or 0. Stamens 6—1. Style linear, continous with the nut; style-base small, conic, or hardly any; branches 3, linear, or by accident 2. Nut sessile or stalked, triquetrous or the anterior angle rounded. — Very varied in habit.

Only 1 (the English *S. nigricans*) in Egypt. The genus is now limited by Burthanis character of the elongation of the nut-bearing portion of the axis of the spikelet; it comprises the two common European species, spread in various countries, and a large mass of Australian species, mostly endemic, but 2 or 3 extending to Malaya.

216. **Schoenus nigricans** L. Spec. Plant. I (1753), p. 64. — Boiss. Fl. Or. V, p. 393. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 158 no. 1109. — Glabrous; stolons 0; stems stoutly tufted, 16—40 cm long, leafy only near the base, each with 1 head; basal sheaths often shining chestnut; leaves $\frac{1}{3}$ — $\frac{2}{3}$ the length of the stem, 1.5 mm broad, channelled at the base, solid trigonous upwards; bracts 2, lower 2—8 cm long, similar to the leaves, dilated and scarious at the base; head 1 cm in diam., of 1—15 spikelets, dense, chestnut-brown or sometimes pale brown; spikelets 6 mm long, 3—1-nutted; glumes minutely scabrous on the keel; hypogynous bristles 3—5, hardly $\frac{1}{2}$ the length of the nut, rigid, yellow-brown; stamens 3; nut $\frac{1}{3}$ the length of the glume, sessile, ellipsoid, trigonous, smooth, pale. — Flow. March to April.

O. Great Oasis: 'Ain Gyaqya, not common; Qasr-el-Go'êta; 'Ain-el-Ehsauya, rare. — **D. a. sept.** Wady Natfe; Bîr-Um-Diseh.

Widely distributed; Europe, North Africa, Abyssinia, South Africa. West and Central Asia to the Punjab; United States, California, Surinam (possibly introduced to the New World).

87. (7.) *Carex* Linn.

Spikelets unisexual or rarely bisexual, female 1-flowered, male (at least in appearance) many-flowered, arranged in compound spikes or (the male often) solitary. Female flower completely enclosed in a utricule (really the bract to a division of the axis). Stamens 3—1; anthers linear-oblong. Style branches 3 or 2. Nut trigonous or flattened. — Perennial herbs with grass-like leaves. Bisexual spikelets occur only in the Subgenus *Eu-Carex*. —

A genus of about 1400 species; scattered throughout the World, but especially in moist places.

- A. Spikelets bisexual, arranged in a continuous or interrupted spike, or panicle, each subtended by bractlets. Stigmas 2

I. Root-stock stoloniferous; leaves filiform, convolute-grooved, shorter than the culm 1. *C. stenophylla*.

II. Root-stock creeping; leaves firm, flat, linear, tapering, as long as the culm 2. *C. divisa*.

- B. Spikelets unisexual, the terminal or upper ones male, the lower female. If they are mixed, the female flowers are more numerous 3. *C. extensa*.

217. (1.) *C. stenophylla* Wahlenberg in Vet.-Acad. Handl. Stockholm XXIV (1803), p. 142. — var. *pachystylis* (Gay) Aschers. and Graebner, Synops. mitteleurop. Flor. II. 2 (1902), p. 25. — Kükenthal Cyperac. in Engler Pflanzenreich IV, 20. — *Carex pachystylis* Gay in Ann. scienc. natur. 2, sér. X (1838), p. 301. — *Carex stenophylla* var. *planifolia* Boiss. Fl. Or. V, p. 400. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 159 no. 1110. — 10 to 20 cm high; root-stock stoloniferous; neck fibrous. Leaves flat, filiform, convolute-grooved, usually curved, shorter than the culm. Spikelets 3—6, crowded into a round, ovate or oblong, tawny to blackish spike, 1 to 2 cm long, the upper spikelets staminate, bracts mucronate to cuspidate; glumes ovate, obtuse or acute, white-margined; utricule ovate, plano-convex, 9—11-nerved, ending in a short beak, with serrulate, scabrous margin, and membranous, retuse mouth. — Flow. March to April.

M. p. El-Arish; Grady.

Also known from Syria.

218. (2.) *Carex divisa* Huds. Flor. angl. ed. 1 (1762), p. 348. — Boiss. Fl. Or. V, p. 401. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 159 no. 1111. — Kükenthal l. c., p. 125. — *Carex curiaea* Boiss. Fl. Or. V, p. 402 not Kunth. — 20 to 60 cm high; root-stock creeping. Leaves

Stems flat, linear, tapering, often as long as the culm: culms erect, sometimes spike compound, ovate to oblong, 1 to 4 cm long, the upper spikeless terminate, all close together, or the lower separate: lower bracts long-awned, sometimes as long as the spike: glumes buff to tawny, keeled, acute or sometimes mucronate: utricle ovate, plane-convex, obsoletely nerved, ending in a short, bidentate beak. — Flow. February to March.

M. ma. Marouta; Alexandria, common on the borders of fields: Kh. Ghar; Ramla not common. — **M. p.** Damietta. — **N. d.** Fia; Damietta; Menaket-el-Kedr; Mansura; Zagazig; Cairo. — **N. f.** Menaket-el-Farim, not common; Senhur; Senûria, rare; Tania. — **N. v.** Bah; Mimia not common; Elkhilim; Kene; Karnak; Aiwân, not rare. — **O.** Little Oasis; Dakhel; Great Oasis.

Local name: sârad; khubb (Ascherson).

Also known from Europe, North Africa, South Africa and Asia.

212. (3.) Carex extensa Good. in Trans. Linn. Soc. II (1794), p. 175 tab. XXI fig. 7. — Boiss. Fl. Or. V. p. 474. — Ascherson & Schweinf. III. Fl. d'Ég. p. 159 no. 1112. — Koenigstein l. c. p. 666. — 50 to 70 cm high: root fibrous: culms erect, glabrous, obscurely quadrangular. Leaves pale, convolute-grooved. Male spikelets fusiform, 1.5 cm long; female spikes 2-3, ovate-oblong 8-12 mm long, dense, sessile, crowded at the base of the male spikelet, the lowest sometimes a little distant, short peduncled; bracts leaf-like, much longer than the spikelets and culm; glumes ovate, obtuse, often mucronulate, tawny, green-nerved, as long as the fruit or sometimes shorter; utricle ovate, nerved, with a short, blunt, smooth-margined beak. — Flow. March to April.

M. ma. Mex near Alexandria, not common on the sides of the canal; Ramla in ditches, rare. — **M. p.** Rosetta between the railway and the Fort Gafet-Bey.

Local name: khubb.

Widely distributed in Europe, North Africa, the Orient, South Africa, and North and South Africa.

Principes.

Herbs or trees, with erect or horizontal stems, growing by a single terminal bud. Leaves at the end of the stem: petioles with imbricated bases: blades plaited in the bud, fan-shaped or pinnate. Flowers generally small, perfect or polygamous, disposed in more or less compound axillary racemes. Perianth in 2 series, persistent. Calyx of 3 united or nearly distinct sepals. Corolla of 3 partially united or distinct petals. Androecium of mostly 6, or sometimes

9—12 stamens. Filaments dilated at the base and partially united. Anthers introrse. Gynoeceum of 3 more or less united or distinct carpels. Ovules solitary in each carpel, erect, orthotropous or anatropous. Fruit usually a drupe, developed from 1 carpel, or sometimes a berry. Seeds often hollow. Endosperm horny or cartilaginous, rarely channelled, with the embryo near its surface.

11. Palmae.

Mainly trees, with generally a stout unbranched stem, ending in a crown of a few great leaves; sometimes scrambling, occasionally acaulescent. Flowers numerous in a large compound spike or panicle; generally small and unisexual, regular with an inconspicuous persistent perianth in two trimerous whorls, and six (rarely three) stamens or three superior carpels; carpels free or variously united. Fruit a berry, drupe or nut. Embryo small, inserted in a copious endosperm.

A large family of about 132 genera and 11000 species. Generally distributed throughout the warmer parts of the earth, represented in our district by three genera (except the cultivated specimens).

- A. Tall, unbranched trees, with pinnate leaves and edible fruits (dates).
 - I. Sides of leaflets reduplicate in vernation . . 1. **Phoenix**.
 - II. Sides of leaflets induplicate in vernation . . 2. **Cocos**.
- B. Trees with forked branches, palmate leaves, and fruits like small cocoa-nuts, with fibrous sarcocarp enclosing a stone of woody texture 3. **Hyphaene**.

88. (1.) **Phoenix** Linn. (Date-Palm).

Flowers dioecious. Male flower oblong. Calyx cupular. 3-toothed. Petals 3, slightly connate at the base, valvate. Stamens 6; filaments connate at the base; anthers linear-oblong, erect, dorsifixed. Rudimentary ovary small or none. Female flower globose. Calyx as in the male. Petals 3, rotundate, concave, widely imbricate. Staminodia 6, connate. Carpels 3, distinct; stigma sessile; ovule erect. Fruit oblong (by failing of 2 carpels), 1-seeded, stigma terminal. Seed deeply grooved on the ventral side; embryo minute, dorsal; albumen cartilaginous. — Unarmed trees; leaves pinnate; pinnae lanceolate, induplicate; spathe solitary; spadix intrafoliaceous, branched; flowers small, yellow.

A small genus of about 12 species, dispersed through tropical and subtropical Asia and Africa.

220. **Phoenix dactylifera** L. Spec. Plant. I (1753), p. 1188. — Boiss. Fl. Or. V, p. 47. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 147 no. 1024. — Forsk. Flor. aeg.-arab., p. CXXXVI. — Delile Fl. d'Eg., p. 169 tab. LXII. — Stem tall, straight, cylindrical, soboliferous at the base, scaly in the younger parts with the remains of leaf-bases. Leaves 3 m or more long, glaucous; leaflets lanceolate-linear, acuminate, somewhat 4-ranked, the anticous often distichous, irregularly and remotely aggregate, the central longest. Female flower globose. Corolla twice as long as the calyx. Drupe long, cylindric-elliptic, variously coloured, usually more than 2 cm long; pericarp thick, fleshy, saccharine. —

M. ma. M. p. N. d. N. f. N. v. O. D. i. D. i. D. a. sept. D. a. mer. Cultivated everywhere in many varieties (cf. Appendix of the cultivated plants). Often found spontaneous or subsponaneous.

Local name: Male tree: Nakhle el Dakar. — *Female tree:* Nakhle el Entaiyia. — *Leaf-stalk:* Gerideh. — *Little spine-like pinnules:* Zill. — *Great pinnules:* Khûz. — *Spathe:* Af. — *Inflorescence of male flowers:* Argûn. — *Inflorescence of female flowers:* Zabata. — *The unripe fruit:* rotab. — *The ripe fruit:* Belah; tamr. — *Seed:* Nawaiyia. — Nawa. —

The Date-palm is found from the Canaries through the Sahara and Arabian deserts to south-west Asia. It is also cultivated in southern Europe, yielding fruit as far north as 38° north latitude. Owing to this species having been cultivated throughout northern subtropical Africa from remote times, it is difficult to decide where it is truly indigenous.

89. (2.) **Cocos** Linn.

Flowers monoecious, male flowers: sepals 3, small; petals 3, valvate; stamens 6, pistillode minute or 0; female flowers: much larger than the male one, sepals 3, petals 3, orbicular, convolute, staminodes a fleshy disk; ovary 3-celled (2 empty), style very short, stigmas 3, ovule subbasilar; fruit large, ovoid, trigonous, 1-seeded, style terminal, pericarp thick, fibrous, endocarp bony or stony, with 3 basal pits, indicating the 3 cells of the ovary; seed cohering with the endocarp, embryo small in fleshy or horny endosperm, opposite to one of the pits. — Unarmed, erect, monoecious palms; leaves pinnatisect, leaflets narrow, sides reduplicate in vernation; spadix first erect, simply paniced, branches drooping, elongate, many-flowered, usually with solitary male flowers in the upper part, and with solitary female flowers or 2 males and an interposed female in the lower part; spathes 2 or more, elongate, simple, lower woody.

A genus of 36 species, probably all of American origin.

221. **Cocos nucifera** L. Spec. Plant. I (1753), p. 1188. — Trunk 10 to 20 m high. 25 to 60 cm in diameter, thickened and ascending at the base, inclined, black, rarely forked; leaves 3 to 4 m long, leaflets 40 to 60 cm long, linear-lanceolate, acuminate, flaccid, bright green, petiole 90 to 120 cm long, stout, unarmed; spadix 1—1.20 m long, straw-coloured, simply branched, shortly stoutly peduncled, branches flexuous, densely fascicled; spathe 40 to 80 cm long, narrowly oblong, tapering at both ends, glabrous or downy, splitting longitudinally; male flowers small, yellowish; sepals 0.25 cm long, ovate, acute; petals 0.75 cm long, oblong-lanceolate; filaments subulate, anthers linear, erect; female flowers few, bibracteolate; sepals about 2.5 cm long, concave, petals rather smaller; ovary seated on an orange-coloured disk; fruit trigonously obovoid, oblong or subglobose, 12 to 20 cm long, endosperm forming a thick white layer of a fleshy fibrous oily substance, adherent to the almost stony black endocarp.

R. „Berenice.“ (Mr. d'Abaza writes to Mr. Fish: „The existence of Cocconut palme somewhere near Berenice on the Red Sea Coast has been affirmed to me by an English Naval Officer who had been many years in the tropics and must have known the tree well. — The fact was subsequently confirmed to me by the captain of one of the Khedivial Mail boats in 1907. I have seen myself the palm growing near Djibouti in Djedda and one solitary tree even at Yambo“.)

The original home of this widely diffused tree is unknown. Martius, whose speculation has met with most favor, places it on the western border of the isthmus of Panama.

90. (3.) **Hyphaene** Gaertner. Dûm-Palm.

Flowers dioecious. Male flower: Calyx 3-lobed, imbricate. Petals broadly ovate, concave, connate into a short stalk at the base, glumaceous, imbricate. Stamens 6; filaments short, subulate; anthers linear, 2-lobed at the base, basifixed. Rudimentary ovary none. Female flower shortly pedicelled, larger than the male. Sepals ovate orbicular, obtuse, imbricate. Petals slightly smaller than the sepals, broadly ovate, obtuse, imbricate. Staminodia 6, connate into a membranous cup. Ovary subglobose, obscurely 3-lobed, 3-celled; stigmas 3 (rarely 2 or 3), sessile; ovule laterally affixed near the base. Fruit sessile or stalked, 1-celled; stigma basilar; pericarp grumose with shining epidermis; endocarp woody. Seed adnate to the endocarp, which is intruded at the base, erect; raphe with reticulate branches; albumen bony, homogeneous; embryo apical. — Unarmed or slightly spiny medium or large sized trees; leaves

flabellate; petiole ending in a short ligule; spadices with cylindrical spathes; branches alternate with subfastigiate branchlets; bracts semicircular, very densely imbricate; bracteoles membranous; flowers immersed in the branchlets, the male in pairs, the female solitary.

Species about 9, dispersed through tropical Africa, Arabia, and the Mascarene Islands.

222. **Hyphaene thebaica** Mart. Hist. Palm. III (1836—1850). p. 225 tab. CXXXI—CXXXIII. — Boiss. Fl. Or. V, p. 46. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 147 no. 1025. — Sickenberg. Contrib. Fl. d'Eg., p. 287. — *Corypha thebaica* L. Spec. Plant. I, p. 1187. — *Cucifera thebaica* Delile Fl. d'Eg., p. 145 tab. I, II. — Stem terete, 3 to 9 m high, about 30 cm in diameter, simple or more frequently dichotomously branched. Leaves 20—30 in a terminal crown on each branch; petiole sheathing at the base, triangular below, plano-convex upwards, spiny on the margins, with a rusty tomentum; lamina suborbicular; lobes 20 or more, linear-lanceolate, acuminate, 30—50 cm long, 1 cm wide; primary nerves thick, concave above, secondary numerous. Male spadix 80 to 100 cm long, 2—5 cm thick at the base, at first erect, afterwards patent; spathes nearly cylindrical; flower-bearing branches 12—20 cm long, 3—2 at the end of the branches 6—8 cm long; bracts 3 mm long; flowers in pairs, shortly pedicellate. Calyx 3-lobed, contracted below. Corolla stipitate; lobes broadly ovate, obtuse, concave. Stamens 6, rarely 7; filaments subulate from a thickened base; anthers linear, slightly sagittate, nearly basifixid. Rudiment of a ovary absent. Female spadix like the male; bracts densely imbricate, with a transverse line of tomentum half-way up the back; flowers very shortly pedicellate. Calyx-lobes orbicular-ovate, light green. Petals smaller than the sepals, orbicular-ovate, concave. Staminodes 6. Ovary globose or 3-lobed; stigmas sessile or nearly so. Fruit of 1 (rarely 2—3) obliquely-ovoid carpel, 6 cm long, 4 cm in diameter. Seed ovoid. —

N. v. Deyrût-esh-shef; cultivated and spontaneous; Luksor; Dendera; Kene. — **D. a. mer.** Wady Gemâl. — **O.** Dakbel, very rare. — Great Oasis, common.

Local name: dûm.

Also found in the Upper Nile countries, southern Sahara, Sudan, in Guinea and Arabia.

Spathiflorae.

Perennial, frequently bog or aquatic herbs, or rarely trees; in Lemnaceae reduced to very small or minute floating thalloid plants. Leaves mainly basal: blades sword-like or expanded.

Inflorescence a spadix, the complete or incomplete flowers wholly or partially covering the axis, sometimes subtended by or enclosed in a spathe, or in Lemnaceae, with one or few flowers in propagative pouches on the margins of the plant-body. Perianth not readily separable into calyx and corolla, sometimes wanting. Fruit a berry or an utricle.

12. Araceae.

Flowers unisexual or bisexual, with or without a perianth, sessile on a spadix enclosed within, adnate to, or subtended by a green or coloured spathe. Spadix monœcious or rarely unisexual, with or without a terminal barren appendix, and with or without neuter organs on various parts of it, or entirely covered with bisexual flowers. Perianth, when present, of 4—9 free or connate segments. Stamens 4—6, rarely more or fewer (when the male flowers have no perianth, the stamens are crowded together so that the number belonging to each flower is often indeterminable). free or connate; filaments none, or broad and flat, or rarely filiform; anthers opening by terminal pores, or by short or long longitudinal slits; pollen often emitted in sausage-like strings. Ovary sometimes surrounded by staminodia, superior, or rarely inferior, with or without a style, and with an entire or lobed stigma, one to many-celled, with axile, parietal, basal or apical placentation; ovules 1—many in a cell, orthotropous, campylotropous or anatropous. Fruit a 1—many-seeded berry. Seeds albuminous or exalbuminous. — Herbs or shrubs, with a thick fleshy or tuberous rootstock, or with erect, creeping, or climbing stems, simple or branched; leaves alternate, radical or cauline, usually with sheathing petioles, net- or parallel-veined; spathe open to the base or the lower part convolute or tubular, wholly deciduous or persistent, or only the tubular part persistent.

Genera about 100. Species about 1000, chiefly concentrated in the Tropics of both hemispheres, very few in the temperate regions.

A. Floating aquatic herbs, leaves in a small flattened rosette, cuneate-oblong 1. *Pistia*.

B. Tuberous-rooted herbs, not floating.

I. Leaves entire.

a) Spathe 4—5 cm long; leaves sagittate; leaves and flowers produced together 2. *Arisarum*.

b) Spathe 6 to 20 cm long; leaves linear, oblong or lanceolate; leaves and flowers produced at different times, the leaves after the flowers 3. *Biarum*.

II. Leaves pedately dissected 4. *Helicophyllum*.

91. (1.) **Pistia** Linn.

Spathe small, tubular below; limb open, oblique, constricted on each side at its base. Spadix shorter than the spathe, monœcious, with the female part adnate to the back of the spathe, and the male part free, stipitate, having two neuter organs at its base, the upper cup-shaped or frill-like, the lower suborbicular or subreniform in outline with the sides bent inwards or downwards. Flowers unisexual. Perianth none. Female inflorescence of a single ovary, apparently arising from the back of the spathe, very oblique, 1-celled; style obliquely erect from the top of the ovary; stigma capitate; ovules numerous, basal, orthotropous. Male inflorescence: a stipitate whorl of 3—8 flowers, each flower composed of 2 connate, 2-celled anthers, opening by short slits. Fruit ellipsoidal, with a thin pericarp, many-seeded. Seeds cylindric-oblong, truncate at each end, depressed at the apex and with an operculum closing the micropyle, rugulose, albuminous; testa thick, with a brown membranous outer and inner skin, and a thick, white cellular layer between them; embryo minute, apical. — A floating, stoloniferous, stemless herb, with a tuft of fibrous roots; leaves in a rosette, with flabellate veins, raised beneath; spathes axillary, with very short peduncles.

A single species, variable in the form of its leaves, found throughout the tropical and subtropical regions of the globe, in still, fresh water.

223. **Pistia stratiotes** L. Spec. Plant. I (1753), p. 963. — Boiss. Fl. Or. V, p. 45. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 147 no. 1023. — Engler in DC. Monogr. Phaner. II, p. 634. — Leaves sessile in a rosette, 2—6 cm long, 2—4 cm broad, cuneate-obovate, notched or entire at the broadly rounded or subtruncate tip, more or less pubescent on both surfaces, tomentose with long matted hairs at the base; spathe 6—10 mm long, more or less hairy or villose outside, glabrous within, pale green; limb ovate, subobtuse, with a broad, white, ciliolate margin; ovary pale-green, pubescent: neuter organs frill-like, pale green; anthers dirty-white. — Flow. December to January.

N. d. Aulâd Hamâm near Damietta, in the lake Menzale, not common.

Local name: Hay-adem-el-mâ (Delile).

Widely distributed in all the warm regions of the earth.

92. (2.) **Arisarum** Targ-Tozz.

Spathe at the length caducous, tube long, straight, closed, somewhat contracted at throat, limb curved forward, hood-like.

Spadix coalescent at the back with the lower part of the spathe, with 3—5, female flowers on one side, and just above them a loose spike of male flowers, ending in a long, stalked, filiform or club-shaped appendage. Female flowers: ovary immersed in the lower part of the spadix, 1-celled, many-ovuled; style cylindric-conical, stigma hemispherical, tasseled. Ovules attached to the basilar placenta by short funicles, orthotropous, erect. Male flowers: monandrous, short stalked, anther peltately attached, horseshoe-shaped, the two cells dehiscent by a continuous slit. Berries aggregated. Seeds about 6, ovoid, acute, longitudinally wrinkled, borne on an obconical funicle with a strophiole longer and thicker than the funicle. — Cormous herbs, with sagittate leaves appearing with the flowers. —

A small genus of Mediterranean origin.

224. **Arisarum vulgare** Targ.-Tozz. in Ann. Mus. Par. II, 2 (1810), p. 266. — var. **Veslingii** Engler in DC. Monogr. Phaner. II (1879), p. 563. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 146 no. 1022. — Boiss. Fl. Or. V, p. 44. — Perennial; petioles slender, much longer than the blade; blade ovate-cordate to sagittate, 10 cm long, 8 cm broad, obtuse or acute, auricles rounded or acute, more or less divergent. Peduncle about as long as the petiole, much longer than the spathe; spathe cylindrical, 8—10 cm long, white-and-red-lined, ending in a purple, ovate to lanceolate, incurved hood; hooden often longer as the tube; female inflorescence very short; male inflorescence thrice as long; appendix exserted, slender, curved forward above mouth, thickened at the tip. — Flow. December.

M. ma. Abusîr; Mariut; Alexandria; Ramle; Gaf el Bajudat near Mariut; sheyl-el-akhteriya; Abukir in sandy places, not common.

Local name: Nirish; reynish.

Also known from Palestine and Syria.

93. (3.) **Biarum** Schott.

Spathe convolute at the base into an ovate or oblong tube with more or less connate margins. The female flowers at the base of the spadix, and the staminate at the tip of the lower segment, separated by a long interspace, the spadix produced into a naked, cylindrical or club-shaped appendix. Male flowers: anthers 2 together, 2-celled, the connective somewhat elongated, dehiscent at the tip by a slit or pore. Female flowers: ovary 1-celled, 1-ovuled, tipped by a short, discoid, sessile stigma or a style; ovule sessile, basal, orthotropous; abortive stamens subulate from a thickened base above the pistils

and sometimes above the stamens; berry 1-celled. 1-seeded. — Cormous herbs with ovate, oblong, lanceolate or linear leaves.

A small genus inhabiting in the Mediterranean region.

225. **Biarum Olivieri** Blume in Rumphia I (1835), p. 115. — Engler in DC. Monogr. Phaner. II, p. 580. — Aschers.-Schweinf. III. Fl. d'Eg., p. 146 no. 1020. — *Biarum alexandrinum* Boiss. Fl. Or. V, p. 34. — Perennial; leaves few, linear to linear-lanceolate, 5 mm or less broad, tapering to a narrow petiole, with often wavy margins. Peduncle usually longer than the spathe; spathe 3 to 6 cm long, dark greenish-purple, tube ovate, connate throughout, abruptly contracted into a linear lamina twice its length; appendix of the spathe filiform, blackish-purple, as long as the spathe or sometimes longer; female inflorescence short-ovate; male inflorescence short cylindrical, rather loose, about as long as the interspace. — Flow. November to December.

M. ma. Abusir; Mex near Alexandria in sandy places; Mandara; Ramle; Abukir. — **M. p.** Bir Mabrûky. — **N. d.** Canal near Hagret-el-Nanatiya.

Also known from Syria.

94. (4.) **Helicophyllum** Schott.

Spathe convolute at the base into an ovate or oblong tube, lamina concave. Stalk of the spadix bearing rings of female and male flowers, with intervening sterile stamens, and ending in a club-shaped appendix. Male flowers: anthers twin, 2-celled, the connective not elongated, the cells dehiscent by a slit toward the tip. Female flowers: ovary 1-celled, 2-ovuled. Ovules orthotropous, erect, basilar, attached by a short funicle. Sterile stamens subulate, between the staminate and pistillate flowers. Berry usually 1-seeded. — Cormous herbs, with more or less dissected, hastate leaves, appearing with the flowers.

226. **Helicophyllum crassipes** (Boiss.) Schott Syn. Aroid. I (1856), p. 22. — Engler in DC. Monogr. Phaner. II, p. 600. — Aschers.-Schweinf. III. Fl. d'Eg., p. 146 no. 1021. — Boiss. Fl. Or. V, p. 42. — Perennial; 20 to 40 cm high. Petiole longer than the lamina, often purple-spotted, lamina ovate in outline, pedately parted into 7—9, twisted, linear-lanceolate, lateral lobes, the intermediate segment linear-lanceolate to oblong-lanceolate. Peduncle shorter than the petioles, much thickened at the tip; spathe with a thick, oblong tube, open to the base, whitish-green or purple-spotted without, two-thirds to one-half as long as the ovate-oblong, obtuse, blackish-purple, more or less spotted and warty, lamina; spadix shorter than

the spathe, appendix cylindrical-club-shaped, blackish-purple; interspace twice to four times as long as pistillate ring, densely beset with sterile stamens. — Flow. March to May. —

M. ma. Mariut, between Sandib and Birkhreyr; Mex near Alexandria in deep sand. — **M. p.** El-Grady; El-'Arish.

Local name: ergeyta.

Also known from Palestine.

13. Lemnaceae.

Flowers very minute, seated in a cavity at the margin or in the upper surface of the frond, consisting of 1—2 stamens accompanied by a sessile ovary, either naked or enclosed in a membranous spathe (or perianth?), which bursts irregularly as the stamens mature. Stamens exerted from the frond; filaments filiform; anthers 1—2-celled; cells subglobose, opening by transverse slits or by a slit across the top. Ovary narrowed into a style or with a subsessile stigma, 1-celled; placenta basal; ovule solitary or several in an ovary, anatropous, semianatropous, or orthotropous. Fruit 1-several-seeded, indehiscent or opening transversely. Seeds minute, albuminous; embryo straight, axile. — Small or minute, gregarious, floating plants, consisting of suborbicular, elliptic, obovate, oblong or linear fronds of cellular tissue, with or without rudimentary vessels, usually 2 or more fronds connected together as one plant, flat on both sides or more or less convex beneath, sometimes as thick as broad, developing young fronds (which remain attached to the parent frond for some time) from a cavity or cavities placed near or at the basal end of the frond, rootless or producing one or more roots from the middle of the under surface.

A small family of only two genera and about 28 species; distributed throughout all warm and temperate countries, in still water.

- A. Frond with one or more roots. Flowers seated in a cavity at the margin of the frond 1. *Lemna*.
- B. Frond rootless. Flowers seated in a cavity in the upper surface of the frond 2. *Wolffia*.

96. (1.) *Lemna* Linn.

Flowers very minute, very rarely seen in some of the species, seated in a cavity at the margin of the frond, enclosed in a minute membranous spathe. Stamens 1—2; anthers 2-celled; cells opening by transverse slits. Fronds small or minute, with one or more roots on their undersurface, floating on still waters, thin and flat, or flat above and more or less convex beneath, orbicular elliptic, oblong,

obovate or spatulate in outline, entire, or in one species minutely denticulate on the margin; roots tipped with a distinct sheath-like rootcap.

Species about 16, distributed through all warm and temperate countries.

A. Each frond with several roots 1. *L. polyrrhiza*.

B. Each frond with one root only.

I. Fronds subrotund, 3,75—7 mm in diameter, underside very convex and greenish-white 2. *L. gibba*.

II. Fronds elliptic or elliptic-oblong, 1—6 mm long, rather thin, flat above, not very convex beneath.

a) Root-cap obtuse; root-sheath not winged 3. *L. minor*.

b) Root-cap acute; root-sheath winged . . 4. *L. paucicostata*.

227. (1.) **Lemna polyrrhiza** L. Spec. Plant. I (1753), p. 970. — Spirodela polyrrhiza Schleiden in Linnaea XIII (1839), p. 392. — Boiss. Fl. Or. V, p. 30. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 146 no. 1019. — Fronds 3—9 mm long, 2—6 mm broad, elliptic, suborbicular, or somewhat obovate, usually slightly oblique at the basal end, thin, flat above, slightly convex beneath, bright green above, purple beneath; young fronds sessile. Roots several, fascicled on the undersurface of each frond, towards the basal end. Flowers very rarely seen. — Flow. March to July.

M. ma. Alexandria; Gabari. — **N. d.** Rosetta; Damietta, in ditches of the rice-fields, common.

Local name: 'ades-el-mâ.

Widely distributed in most warm and temperate regions.

228. (2.) **Lemna gibba** L. Spec. Plant. I (1753), p. 970. — Boiss. Fl. Or. V, p. 30. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 146 no. 1018. — Hegelmaier, Monogr. Lemnac., p. 145 tab. XI—XIII, and in Engler's Bot. Jahrb. XXI, p. 289. — Fronds 3,7—7 mm long, and nearly as broad, subrotund or broadly obovate, very thick when alive, flat and bright green above, very convex, greenish-white and somewhat spongy beneath, young fronds sessile. Roots solitary from the under surface of each frond. Flowers rare. — Flow. March to April.

N. d. Ditches near Abu-el-akhdar; Alexandria; Benha-el-'Asal; Damanhûr; Rosetta; Matariya; Zaqaiziq; Qalyûb; Cairo. — **N. f.** Medinet-el-Fayûm; Kôm-Fâris; Tomîa; Senhûr; Senûris; Kafr Mukfût. — **O.** Little and Great Oasis.

Local name: Khass (Ascherson).

Also in tropical Africa, and widely distributed in Europe, Asia and America.

229. (3.) **Lemna minor** L. Spec. Plant. I (1753), p. 970. — Boiss. Fl. Or. V, p. 29. — Hegelmaier, Monogr. Lemn., p. 142 tab. IX. X, and in Engler's Bot. Jahrb. XXI, p. 291. — Fronds 2 to 5 mm long, 1.27 to 3 mm broad, elliptic, elliptic-oblong or somewhat obovate, rather thin, nearly flat on both sides, bright green; young fronds sessile. Root solitary from the undersurface of each frond; root-sheath not winged; root-cap obtuse. Ovary flask-shaped, with a distinct curved style. Ovule solitary, semi-anatropous. — Flow. March.

N. d. Zaqaziq, in canals, not rare.

Widely distributed through the warm and temperate regions of the earth.

230. (4.) **Lemna paucicostata** Hegelmaier in Monogr. Lemnac. (1868), p. 139 tab. VIII. — Boiss. Fl. Or. V, p. 30. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 146 no. 1017. — Hegelmaier in Engler's Bot. Jahrb. XXI, p. 294. — Fronds 1.27—3 mm long, 1.27 to 2.5 mm broad, oblong or elliptic, often somewhat oblique at the basal end, rather thin, nearly flat on both sides, bright green; young fronds sessile. Root solitary from the undersurface of each frond; root-sheath winged on each side; root-cap acute. Ovary flask-shaped, with a distinct more or less curved style. Ovule solitary, semi-anatropous. Fruit ellipsoid, longitudinally ribbed. — Flow. March to April. —

O. Little Oasis: Mendisha; Dakhel: 'Ain Sherif; Great Oasis: el-Kharge with *Lemna gibba*, abundant; Qasr.

Local name: likh (Ascherson).

Widely distributed through the warmer parts of the earth. —

This species is very similar to *Lemna minor* L., and not easily distinguishable in the dried state without careful examination. The fronds, however, are smaller, and the root-cap more acute than in *Lemna minor* L., and the root-sheath has a wing on each side of it, which is wanting in *Lemna minor* L. —

97. (2.) **Wolffia** Horkel.

Flowers seated in a cavity or in two separate cavities in the upper surface of the frond, without a spathe, microscopic, rarely seen. Stamen 1; anther 1-celled, opening by a slit across the top and the valves becoming reflexed. — Fronds small or minute, thin and flat, or as thick as broad, subglobular, hemispherical, ellipsoid, elliptic, oblong or linear, entire or rarely toothed at the margin or end of the frond, entirely destitute of roots, but in two species the lower lip of the cavity from which the young frond emerges is produced into a moderately long flat hyaline process that might

easily be mistaken for a root; this process is a development of the stalk by which the young frond is attached to its parent, and which elongates extraordinarily after their separation. —

Species 12, widely distributed in all warm and temperate parts of the earth.

231. **Wolffia hyalina** (Del.) Hegelmaier Mongr. Lemnac. (1868), p. 128 tab. IV figs. 11—19, and in Engler's Bot. Jahrb. XXI, p. 301. — Boiss. Fl. Or. V, p. 29. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 146 no. 1016. — *Lemna hyalina* Delile Fl. d'Eg., p. 64. — *Wolffia* Delilei Schleiden in Linnaea XIII, p. 390. — Frond very small, 2.5 mm long, 1 mm broad, elliptic or elliptic-oblong, thin flat, very obtusely rounded at the end, entire or occasionally minutely denticulate, producing from the lower edge of the cavity from which the young frond emerges a broad flat linear colourless process, about twice as long as the individual fronds, and $\frac{2}{3}$ as broad. Flower seated in the upper surface of the frond a little to one side of the middle, and nearest the basal end, according to Hegelmaiers figures. — Flow. April.

N. d. Alexandria; Damietta; Matariya; Rosetta; Benha-el-asl; Abu-Roash; Damanhur; Mansura; Tanta; Zagaziq; Qalyub; Cairo. — N. v. Helwan, in ditches near the Nile; Siut; Kene; Qurna.

Also known from Darfur, Kordofan and German East Africa.

Farinosae.

Terrestrial, commonly bog-inhabiting herbs or epiphytes. Leaves often basal: blades prevailingly narrow. Inflorescence usually not a spadix, but often with a spathe-like bract or a spathe. Flowers mostly complete. Corolla regular or nearly so. Gynoecium compound, superior or rarely inferior. Fruit a capsule or utricle, or baccate. Seed with mealy endosperm.

14. Commelinaceae.

Flowers often small, bisexual, or the upper part of the cyme male. Sepals 3; one (dorsal) entirely without, hooded. Petals 3, blue, yellow, or white, free or claws united into a linear tube in *Cyanotis* and *Coleotrype*. Stamens 6, where of 1—4 are often sterile, reduced to staminodes or wanting; filaments often bearded by beaded hairs. Ovary free, 3- (sometimes 2-) celled; style simple; ovules one or several in each cell, attached to the inner angle. Capsule loculicidal; embryo small, shortly cylindrical, far from the hilum, loose in the floury albumen; radicle close to the foramen covered externally by

the embryostega. — Herbs; leaves alternate, ovate lanceolate or linear; bases sheathing.

A family of about 76 genera and 330 species, in all warm countries.

98. *Commelina* Linn.

Inflorescence of 2—1 cymes included (or nearly so) within a folded or funnel-shaped spathe. Petals clawed; 2 equal, the third exterior, smaller. Stamens 3—5 anterior perfect, 3—5 dorsal sterile. Ovary cells 2 anterior equal, 2—1-ovulate, dehiscent; the third dorsal 1-ovulate, or empty or suppressed. Seeds 5—1; hilum linear vertical. — Annual succulent weeds; flowers marcescent; the spathe is an ovate leaf-like bract, either simply folded boat-like, or its lower margins connate, so as to form an oblique funnel; the flowers of the lower cyme (and the upper flowers of the upper cyme) are usually male.

Species 120 in all warm countries.

232. *Commelina Boissieriana* C. B. Clarke in DC. Monogr. Phan. III (1881), p. 161. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 154 no. 1073. — Suppl. Fl. d'Eg., p. 776. — Nearly glabrous. Leaves 7 cm long, 0.75 cm broad, lanceolate sessile. Peduncles scattered, exserted, 1.27 cm from the leaf-sheaths. Spathes 2.5 cm long, broadly ovate, acute, thinly hairy, margins connate at the base. Petals blue. Capsule 1 cm long, broadly oblong, obtuse, soon 3-valved; seed of the dorsal valve smooth; seeds of the ventral cells unknown. — Flow. April.

M. ma. Alexandria, naturalized. — **M. p.** Rosetta; Port-Said — **N. v.** Cairo, naturalized and cultivated in gardens.

Also known from Eritrea and Abyssinia.

15. Pontederiaceae.

Aquatic or marsh herbs, with the lower part of the stem or rhizome creeping and rooting in the mud, or entirely floating; leaves alternate, hastate, cordate, orbicular, ovate, lanceolate or linear, entire, usually with a sheathing petiole, the submersed leaves sometimes without blades, or different in form; inflorescence terminal, either fascicled in the sheath of the flowering-leaf, or spicate, with the flowers solitary or fascicled along the axis of the spike, rarely solitary and axillary. Flowers bisexual, all alike or some cleistogamous, regular or slightly irregular. Perianth inferior, petaloid; segments 6, biseriate, united into a tube in the lower part, rarely free, equal or the outer series smaller. Stamens 3 or 6, rarely 1, usually of two

sizes and often of different colours; filaments free; anthers basifixed or dorsifixed, 2-celled, introrse, opening by longitudinal slits, or rarely by terminal pores. Ovary superior, 3-celled with axile placentas, or 1-celled with 3 parietal or more or less prominent placentas; style filiform, stigma entire, thickened or subcapitate, or shortly 3-lobed; ovules numerous and biseriate in each cell, or rarely solitary, anatropous. Fruit a many-seeded capsule, or rarely a 1-seeded achene. Seeds small, ovoid, ribbed; embryo cylindrical, straight, imbedded in the centre of a copious albumen.

Species about 25, chiefly natives of Tropical Africa and Tropical America, about 4, occurring in North America, 2 or 3 in Tropical and Temperate Asia, and 1 in Australia. Only one species has yet been found within the confines of the Egyptian Flora.

99. *Eichhornia* Kunth.

Perianth funnel-shaped, with a long or short tube; segments a little unequal, the interior series broadest, and the upper segment of that series usually marked with a spot. Stamens 6, the 3 upper ones included, the 3 lower more or less exerted, usually with longer filaments and inserted higher up the perianth-tube; filaments filiform; anthers dorsifixed, oblong. Ovary sessile, 3-celled; style filiform; stigma slightly dilated or very shortly 3- or 6-lobed; ovules numerous in each cell. Capsule included in the marcescent perianth-tube, ovoid, oblong or linear-fusiform; pericarp membranous. Seeds numerous, ellipsoid or oblong, finely ribbed; embryo cylindric, in the centre of the albumen. — Aquatic herbs, entirely or floating, or the lower part of the stem creeping and rooting in the mud. Leaves with long petioles sheathing at the base, and obovate, orbicular, ovate or lanceolate blades, cordate or narrowed at the base, or the submersed leaves linear, sheath of the petiole often much produced at the tip and then described as a stipule. Inflorescence pedunculate, spicate or paniculate, with a convolute sheath-like spathe or rarely an expanded bract at its base, or fasciculate within the sheath of the leaf.

A small genus of 6 species, 5 in tropical America, 1 in tropical Africa.

233. *Eichhornia crassipes* Schlechtend. Abhandlg. Nat. Ges. Halle VI (1862), p. 177. — Solms-Laub. in DC. Monogr. Phaner. IV, p. 527. — *Pontederia crassipes* Mart. Gen. et Spec. I, p. 9 tab. IV. — *Eichhornia speciosa* Kunth Enum. Plant. IV, p. 1843. — Roots blue, growing downwards into the mud; stems branching about 2,5 mm thick. Floating leaves petiolate; the swollen petioles form floats which support the plant on the surface of the water; the showy

blue flowers are arranged in simple spikes. — Waterhyacinth. — Flow. May.

N. d. Kafr Dowar, spontaneous in the canal, abundant. — Cultivated everywhere.

Liliiflorae.

Relatively fleshy, or grass-like or sedge-like herbs, rarely vines or trees. Leaves various, mostly with flat blades, sometimes scale-like or terete. Flowers perfect, polygamous or dioecious, complete, regular, or in a few cases irregular. Perianth of 3 or 6 members, these more or less readily distinguishable into calyx and corolla, sometimes partially united. Androeceum of 3—6 stamens. Gynoeceum of 3 or rarely 2 united carpels. Ovary superior or nearly so or inferior. Fruit various, commonly a capsule or a lary, sometimes berry-like. Endosperm fleshy or horny.

16. Juncaceae.

Perennial or annual herbs, rarely shrubs, with a woody caudex; stem often leafy only at the base; leaves terete or linear; flowers small, often clustered; bracts scariosse, persistent. Flowers regular. Perianth inferior, cut down to the base into 6 subequal, biserial, glumaceous segments. Stamens usually 6, hypogynous or attached to the base of the segments; filaments filiform or flattened; anthers dorsifixed or basifixed, dehiscing longitudinally. Ovary superior, 1—3-celled; ovules anatropous, usually many in a cell; style filiform, simple or trifurcate. Fruit capsular, splitting into 3 valves. Seeds ovoid, globose or angled by pressure, rarely compressed; testa thin or moderately thick, pale or black, the thin outer membrane sometimes produced beyond the nucleus: albumen copious, fleshy or hard; embryo small, placed near the hilum.

A family of moderate size, comprising 14 genera and about 250 species. The typical genus *Juncus* is widely dispersed, especially in temperate and extratropical regions; the remainder of the family is mainly Australian. The species have no important properties and cannot be said to possess an economic value.

100. Juncus Linn.

Perianth rigid, cut down to the base; segments subequal, ovate or lanceolate. Stamens 6, rarely 3, hypogynous or attached to the base of the perianth-segments; filaments filiform or flattened, anthers linear or oblong, basifixed. Ovary sessile, with 3 more or less intruded parietal placentas; style filiform, divided to the middle into 3

linear or filiform spreading stigmas. Capsule loculicidally 3-valved. Seeds very small, often tailed by the outer membrane of the testa being produced beyond the nucleus; album fleshy; embryo minute, placed near the hilum. — Perennial or annual herbs; leaves various, terete or flat, sometimes reduced to membranous sheaths, allways glabrous; inflorescence terminal or apparently lateral, loosely paniced or congested in to a head; perianth usually brown.

Species 170—180. Cosmopolitan, concentrated in the North Temperate Zone.

- A. *Genuini*. Leaves mostly reduced to sheaths, in the sterile axes one leaf stem-like inflorescence lateral; seeds not tailed 1. *J. glaucus*.
- B. *Maritimi*. Produced leaves few, resembling the stems; inflorescence lateral; seeds tailed.
 - I. Perianth-segments lanceolate, acute 2. *J. maritimus*.
 - II. Perianth-segments obtuse, inner emarginate . . . 3. *J. acutus*.
- C. *Articulati*. Leaves septate. Inflorescence terminal; leaves 3—5; stems often long and decumbent . . . 4. *J. Fontanesii*.
- D. *Graminifolii*. Leaves not septate. Inflorescence terminal, flowers solitary, in forked spikes . . . 5. *J. bufonius*.
- E. *Subulati*. Leaves not septate, subulate. Inflorescence terminal; flowers solitary, in few-flowered cymules 6. *J. subulatus*.

234. (1.) **Juncus glaucus** Ehrh. Beitr. zur Naturk. VI (1791), p. 83. — var. **acutissimus** Buchenau in Abhandlg. Nat. Verein Bremen IV (1873), p. 417, and Monogr. Juncac., p. 245. — Sickenberg. Contrib. Fl. d'Eg., p. 298. — Perennial, densely tufted, with a short creeping rhizome; leaves mostly reduced to shining brown sheaths wrapped tightly round the lower part of the stem; not flowering axes producing a single stem-like frondous leaf; stems terete, wiry, 20—60 cm long, glaucous, with many fine grooves and interrupted pith; panicle apparently lateral, very compound, composed of many dichotomously forked branches; bracts ovate, green, much shorter than the perianth; perianth-segments lanceolate, rigid, very acute, green, 0.5 cm long; stamens 6; capsule oblong, dark brown, minutely cuspidate, nearly as long as the perianth; seeds not tailed. — Flow. April.

N. d. Without precisely indicated locality collected by Hederborg.

This species occurs principally in the northern regions of the Old World. The variety is also known from the Cape.

235. (2.) **Juncus maritimus** Lam. Encyclop. III (1789), p. 264. — var. **arabicus** Aschers. and Buchenau in Boiss. Fl. Or. V (1884), p. 354. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 155 no. 1075. — Buchenau

Juncaceae in Engler Pflanzenr. IV. 36, p. 155. — Perennial, densely tufted on a short rhizome; leaves few, basal, terete, resembling the stems, dilated at the base into pale brown sheaths; stems terete, 20—60 cm long, less robust and less pungent at the tip than in *Juncus acutus*; panicle very compound, produced apparently from the side of the stem a short distance below the tip; flowers clustered; bracts ovate; perianth-segments lanceolate, obtuse, drab-green, 2 mm long; stamens 6; capsule elliptical lanceolate, as long or a little longer than the perianth; seeds distinctly or indistinctly tailed. — Flow. March to April.

M. ma. Matruqa; Dakala; Mariut-Mergheb; Abusîr; Alexandria; Ramle; Mandara; Abukîr, everywhere. — **M. p.** Rosetta, everywhere in fields; Damietta, abundant in fields; Kafr-el-Battikh. — **O.** Siwa; Little Oasis: 'Ain Bishna, common; Great Oasis: Gâina. Bûlâq; Qasr Dakhel in ditches. — **D. l.** Wady Natrûn. — **D. i.** 'Ain Musa near Suez, abundant; Ismailia. — **D. a. sept.** Serapeum near Suez, bords of the canal; Helwan, in salt ditches, very common; Wady Natfe; Wady Makruq; Wady Hamrani. — **D. i.** Bir-Abu-Balah. — **D. a. mer.** Wady Jerawa; Gebel Serai; Wady Zêdun; Luksor in the desert. — **R.** Wady Gemal; Qoseyr; Guebe.

Local name: sammâr; summâr.

Also known from Sinai, Palestine and Afghanistan.

236. (3.) **Juncus acutus** L. Spec. Plant. I (1753). p. 325. — Boiss. Fl. Or. V, p. 353. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 154 no. 1074. — Buchenau in Engler Pflanzenr. IV. 36, p. 149. — *Juncus spinosus* Forsk. Flor. aeg.-arab., p. 75. — Perennial, densely tufted on a short rhizome 60 cm to 1 m or more high; leaves terete pungent, not septate, longer than the inflorescence; bracts ovate longer than the inflorescence; panicle pseudo-lateral, much branched, many-flowered, cymose-corymbose, more or less crowded; perianth-segments pale to brownish, the outer lanceolate, obtusish, the inner ovate, scarious-tipped, retuse; capsule ovate-globular, acute, imperfectly 3-celled, twice as long as the perianth; seeds distinctly tailed. — Flow. March to May.

M. ma. Mariut-Mergheb, not rare; Abusîr; Alexandria; Ramle; Abukîr, common. — **M. p.** Rosetta; Abu Mandur, not common; El-'Abbâs; Damietta, in sandy places; El-Arish. — **N. d.** Alexandria, ricefields along the Canal. — **N. f.** Medînet-el-Fayûm; Kôm Faris; El-Edwa; Kafr Mukfût; Tomia; Senhûr. — **O.** Great and Little Oasis.

Local name: sammâr.

Also in the North Temperate Zone of both hemispheres.

This species and the proceeding are highly esteemed in Egypt for making mats.

237. (4.) **Juncus Fontanesii** Laharpe Monogr. Juncac. (1827), p. 130. — Buchenau in Engler Pflanzenreich IV, 36, p. 190. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 155 no. 1077. — *Juncus articulatus* Desf. Fl. Atl. I, p. 313. — *Juncus pyramidatus* Laharpe l. c., p. 128. — Boiss. Fl. Or. V, p. 361. — Perennial, densely tufted. Leaves 3—5 to a stem, short, septate. Stems moderately stout, scarcely at all striated, erect or long and decumbent. Inflorescence a loose terminal panicle, composed of few or many globose heads; flowers many to a head; bracts ovate, acuminate, pale green, as long as the flowers; perianth-segments lanceolate, very acute, brownish-green, 4 cm long. Stamens 6. Capsule oblong, acute, dark brown, as long as or longer than the perianth. Seeds not tailed. — Flow. February to March.

N. f. Medînet-el-Fayûm; Tomia. — **O.** Little Oasis.

Also known from Mediterranean Region, German East Africa, British Central Africa, Nyassaland and Western Asia.

238. (5.) **Juncus bufonius** L. Spec. Plant. I (1753), p. 328. — Boiss. Fl. Or. V, p. 361. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 155 no. 1078. — Sickenberg. Contrib. Fl. d'Eg., p. 299. — Buchenau in Engler Pflanzenr. IV, 36, p. 105. — Annual, densely tufted; leaves slender, subulate, channelled down the face, the lower nearly as long as the stem, the upper shorter; stem slender, 3—20 cm long; flowers usually single, arranged in loose forked spikes; bracts ovate, scarious, minute; perianth-segments green, lanceolate; stamens much shorter than the perianth, sometimes 3 abortive; capsule oblong, brown, obtuse, minutely cuspidate, rather shorter than the perianth; seeds not tailed. — Flow. March to April.

M. ma. Abusîr; Mariut; Mex; Alexandria; Mandara; Ramle, everywhere common. — **N. d.** Damanhûr; Tanta; Shirbîn; Mehallet-el-Kebîr; Zifta; Zaqaziq; Cairo. — **N. f.** Medînet-el-Fayûm; Biahmu; Sinera; Abûxa; Senhûr; Balchr El-Wady. — **N. v.** Feshn; Abu-Girga; Minima; Siut; Ekhmîm; Kene; Luksor; Aswân. — **O.** Little Oasis; Dakhel; Great Oasis.

Cosmopolitan.

— var. **fasciculatus** Koch Syn. Flor. German. I (1837), p. 732. — Boiss. Fl. Or. V, p. 361. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 155 no. 1078. — Buchenau in Engler Pflanzenr. IV, 36, p. 107. — Flowers in dense, head-like clusters. — Flow. March to April.

N. d. Alexandria; Damietta in rice fields; Shirbîn; Es-Sâlibiya; Ismailia; Qalyûb; Cairo. — **N. v.** Siut; Bibe; Beni-Suêf; Ekhmîm, common; Suhâg; Erment; Esne; Luksor; Aswân. — **O.** Little Oasis.

Cosmopolitan.

239. (6.) **Juncus subulatus** Forsk. Flor. aeg.-arab. (1775), p. 75. — Boiss. Fl. Or. V, p. 354. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 155 no. 1076. — Sickenberg. Contrib. Fl. d'Eg., p. 298. — Buchenau in Engler Pflanzenreich IV, 36, p. 102. — Juncus multiflorus Desf. Fl. Atl. I, p. 313 tab. CXI. — Delile Ill. Fl. d'Eg., p. 84. — Perennial, densely tufted, 50 to 100 cm high; root-stock horizontal, creeping to long distances; culms numerous, terete. Leaves terete, hollow not septate, subulate; panicle with a leaf, often reduced to a sheath at its base, much compounded; flowers solitary, in few-flowered cymules; perianth pale, segments lanceolate, scarious-margined, mucronate; capsule elliptical, somewhat 3-angled, obtuse, mucronate, 3 mm long, about as long as the perianth. — Flow. March.

M. ma. Mariut-Mergheb; Mex; Alexandria; Mandara: 'Azbet-es-Siûf; Ramle. — **M. p.** Rosetta; Abu Mandur; Kafr Lizwani; Damietta; bords of Lake Menzale. — **N. d.** Fûa; Damanhur; Mansûra; Tanta; Abu-Zabel; Zaqaziq; Benha-el-'Asal; Cairo. — **N. v.** Hawara. — **O.** Little and Great Oasis: 'Ain-ed-Doma; Tomb of Sheykh Khâlid Ibn-el-Welid; Qasr Dakhel. — **D. i.** Suez, common; Ismailia.

Local name: Halleyn (Forsk.).

Also known from Marokko to Syria.

17. Liliaceae.

Perennial herbs, rarely shrubs or trees. Root fibrous, or rhizome tuberous or bulbous or creeping. Stem herbaceous or woody, erect or climbing. Leaves usually in radical tufts, or crowded at the ends of the stems or branches, or scattered along the branches, very various in size, shape, and texture. Flowers usually regular, bisexual or rarely unisexual, inflorescence very various. Perianth inferior, petaloid; tube long or short; limb 6-lobed or-partite; segments in 2 series, imbricate or rarely valvate. Stamens 6, rarely 3, inserted towards the base of the perianth-segments and opposite to them, rarely hypogynous; filaments free or connate at the base; anthers oblong or linear, 2-celled, versatile. Ovary superior, 3-celled; style usually simple with a small terminal stigma, or more or less deeply divided into 3 stigmatic branches; ovules few or many in each cell, attached to the inner angle, usually anatropous. Fruit a 3-celled (rarely 1-celled) capsule or berry. Seed 1 or more in each cell, globose or angular or flattened; testa frequently black, crustaceous or membranous; albumen copious, fleshy or horny; embryo small, terete.

A very large and important family found all over the world, but more abundant in temperate and subtropical regions than in the tropics. It is frequently divided into 3 or 4 separate orders. Genera estimated at 190, species about 2500. The family has many useful species. The onion, leek, garlic, and asparagus are well-known edible plants. Aloes, squills and sarsaparilla are important medicines. Phormium produces one of the strongest of vegetable fibres. Some are dangerous poisons, as white Hellebore and Meadow-saffron. Among the multitude of showy garden-plants it will be sufficient to mention the lily, tulip, hyacinth, asphodel, lily of the valley.

A. *Colchiceae*. Rootstock various. Fruit usually a septical capsule. Styles 3.

I. Perianth with a long tube, 6-cleft, without a nectary at the base of the segments .

1. *Colchicum*.

II. Perianth destitute of a tube, 6-partite, with 1—2 nectariferous points at the insertion of the filaments

2. *Androcymbium*.

B. *Euliliaceae*. Fruit a loculicidal capsule. Style entire rarely wanting.

I. *Aloineae*. Herbs, or shrubs, or small trees, with fleshy leaves; perianth united; the very succulent leaves rosetted at the tip of the root

3. *Aloë*.

II. *Lilieae*. Bulbous, caulescent plants. Perianth-segments free. Style terminal. Seeds (except in *Gagea*) compressed, discoid.

a) Perianth campanulate, segments often with a spot at the base, but no pore; stigma small

4. *Tulipa*.

b) Perianth funnel-shaped, segments yellow, or green with yellow margins; nectary 0

5. *Gagea*.

III. *Allieae*. Bulbous plants with scapes. Style arising from the base of the ovary, received into its central tube, then free. Seeds globular or angled.

a) Perianth-segments free

6. *Allium*.

b) Perianth-segments connate at the base

7. *Nothoscordon*.

IV. *Scilleae*. Bulbous plants, with a raceme or spike of flowers borne on a simple, leafless scape. Bracts under each flower herbaceous or scarious, never forming an involucre.

a) Perianth tubular-funnel-shaped, the outer lobes falcate. Ovules numerous in each cell, flattened

8. *Dipeadi*.

- b) Perianth spreading, of distinct segments.
Ovules numerous in each cell, flattened 9. *Urginea*.
- c) Perianth more or less constricted below
the mouth. Seeds 2 in each cell, not
caruncled 10. *Muscari*.
- d) Perianth not constricted. Seeds 2 in
each cell, not caruncled 11. *Hyacinthus*.
- e) Perianth nearly 6-sparged, destitute of
a crown. Flowers lilac, purple, pink
or blue 12. *Scilla*.
- f) Perianth nearly 6 sparged, destitute of
a crown. Flowers white, rarely cream-
coloured, or tawny, divisions green-
banded 13. *Ornithogalum*.
- V. *Asphodeleae*. Root consisting of clustered,
fleshy tubers, or more or less slender fibres,
or a rootstock. Perianth-segments urceolate,
connate at the base or free. Scape leafless,
simple or forked. Flowers white or cream-
coloured; anthers equal 14. *Asphodelus*.
- C. *Asparageae*. Rootstock never bulbous. Fruit
baccate. Leaves reduced to scales. Plants
furnished with sterile, leaflike branches.
- I. Sterile branches (cladodia) subulate, clu-
stered in axills, rarely solitary 15. *Asparagus*.
- II. Sterile branches (phyllocladia or phyllodia)
flattened, resembling ordinary leaves . . . 16. *Ruscus*.

101. (1.) *Colehicum* Linn.

Perianth coloured, funnel-shaped, with an elongate tube and sixparted limb. Stamens 6, inserted at throat, anthers oblong or linear, versatile, introrse. Ovary 3-celled, many-ovuled. Styles 3, free, filiform, long-exserted from the tube, stigma punctate, terminal. Capsule ovate-oblong. Seeds globular. — Herbs with a corm, or rarely with a rootstock, the leaves and flowers included in a radical spathe.

A small genus of 30 species, chiefly in the Mediterranean region and western Asia.

A. Leaves glabrous.

I. Anthers brownish or purple; perianth
segments, elliptic-linear 7—9 nerved . . . 1. *C. Ritchii*.

II. Anthers yellow; perianth segments
elliptic-lanceolate, 9—10 nerved . . . 2. *C. Szovitsii*.

B. Leaves pilose 3. *C. Guessfeldtianum*.

240. (1.) **Colchicum Ritchii** R. Br. in App. ad Denh. et Clapp. (1826), p. 241. — Boiss. Fl. Or. V, p. 163. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 150 no. 1033. — Aschers. in Bot. Ztg. 1878, p. 434. — Sickenberg. Contrib. Fl. d'Eg., p. 294. — *Colchicum aegyptiacum* Boiss. Diagn. Sér. I. 5, p. 66. — *Colchicum stenopetalum* Boiss. et Bl. ex Boiss. Fl. Or. l. c. — Perennial. Corm oblong, 20 to 30 cm long, with 6 brown, leathery tunics, prolonged above the bulb. Leaves lanceolate-linear to linear, spreading-reflexed, the margin often scabrous, glabrous. Flowers 2—8, pink to white, tube included, thrice as long as the limb; perianth segments elliptic-linear, obtuse, 7—9-nerved, with two parallel entire or 1—4-fringed-incised folds at the base of the inner surface; filaments 3—4 times as long as the tawny anther; styles straight, somewhat longer than the stamens, stigma dot-like. — Flow. December.

M. ma. In sandy places at Sidi Gaber near Alexandria; Montaza; Ramle; Mandara; Abukîr.

Local name: ukna.

Also known from Syria.

241. (2.) **Colchicum Szovitsii** C. A. Mey. Ind. Sem. Hort. Petrop. (1834), p. 24. — Boiss. Fl. Or. V, p. 166. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 150 no. 1034. (*Colchicum spec.*) and Suppl. Fl. d'Eg., p. 775 no. 1321. — Sickenberg. Contrib. Fl. d'Eg., p. 294. — Perennial. Corm subglobose, 3 to 4 cm long, 3—4 cm broad, with brown, coriaceous-membranous tunics, prolonged above the bulb; spathe truncate or obtuse. Leaves 3 to 4, glabrous, subchanneled, linear to lanceolate, acuminate 30 cm long, 3 cm broad. Flowers 2—3, white or pale lilac 13 mm long; perianth-segments 2.5 cm long, oblong, 9-nerved; filaments $\frac{2}{3}$ the length of the limb, 3—4 times as long as the yellow anthers; styles straight, somewhat longer than the stamens; stigma punctiform; capsule stipitate, oblong, acute; grain brown, globose, 2.5 mm in diameter. Flow. January.

D. a. sept. Northern Galala, Wady Mohammediyîn; 950 to 1350 m. s. m.

Also known from Persia.

242. (3.) **Colchicum Guessfeldtianum** Ascherson and Schweinfurth in Suppl. Ill. Fl. d'Eg. (1887), p. 774. — Perennial. Corm oblong, 3—4 cm long, with few brown membranous tunics, prolonged above the bulb; spathe purple, obtuse. Leaves 3, linear, obtuse, sometimes shortly acute, 20 cm long, 1 cm broad, the young-ones pilose. Flowers 3 to 6, rose or lilac 12 mm long; perianth segments 3 cm long, linear-oblong, acute, 7-nerved; filaments $\frac{4}{5}$ the length of the perianth-segments; anthers yellow shorter than the filaments.

longer than the styles; stigma punctiform; capsule 1.5 cm long, shortly stipitate, oblong, acute; grain brown, globose, 2 mm in diameter. — Flow. December (?).

D. a. sept. Southern Galala, upper Wady Azhar, 1100—1300 m. s. m.

Local name: qottûn.

Only known from this locality.

102. (2.) *Androcymbium* Willd.

Perianth polyphyllous, marcescent; segments subequal, with a distinct canaliculate claw and an acute lamen with incurved edges. Stamens 6, inserted at the tip of the claw of the perianth-segments; filaments filiform, thickened towards the base; anthers oblong, versatile, dehiscing laterally. Ovary sessile, 3-celled; ovules many, superposed; styles 3, distinct; stigmas minute. Capsule ovoid, chartaceous, dehiscing septicidally. Seeds globose; testa brown, membranous; albumen firm in texture. — Rootstock an ovoid corm, with membranous tunics; stem short, simple or none; leaves crowded in the acaulescent species; flowers crowded in to a globose capitulum, overtopped by the exterior bracts, white, green or purplish.

Species about 20, two inhabiting the Mediterranean and Oriental regions the others in South Africa.

A. *Corymbe* many-flowered; perianth-segments

oblong, claw as long as the limb 1. *A. punctatum*.

B. *Corymbe* few-flowered; perianth-segments ob-

long-lanceolate, limb longer than the claw . . 2. *A. palaestinum*.

243. (1.) *Androcymbium punctatum* Baker in Journ. Linn. Soc. XVII (1879), p. 445. — *Melanthium punctatum* Cav. Anal. Cienc. Nat. III, p. 46 Tab. XXVI Fig. 1. — *Erythrostictus punctatus* Schlecht. in Linnaea I, p. 90. — Aschers.-Schweinf. Ill. Fl. d'Ég., p. 150 no. 1035. — Aschers.-Schweinf. Prim. Fl. marm., p. 670. — Perennial; bulbe ovoide, 12—20 mm long, with brown tunics, produced along the subterranean neck; stem very short. Leaves 6—10, densely rosetted, longer than the corymb, lanceolate, acuminate, tapering, the lowermost usually a pair. Corymb many-flowered, pedicells very short; perianth lilac, limbs 5 mm broad, 6—8-nerved, as long as the claw, lanceolate, obtuse; filaments 6 mm long; anthers oblong, 2 mm long. Capsule chartaceous, oblong-globose, ventricose 1—2 cm long; styles persistent, 6—8 mm long. — Flow. March.

M. ma. Mirsa Matruqa, on calcareous ground.

Local name: Kerkhus.

Also known from Spain, Mauritania and Algeria.

244. (2.) **Androcymbium palaestinum** Baker in Journ. Linn. Soc. XVII (1879), p. 445. — *Erythrostictus palaestinus* Boiss. in Baker l. c. and in Boiss. Fl. Or. V, p. 170. — Sickenberg. Contrib. Fl. d'Eg., p. 294. — Perennial, 50 cm to 1 m high; bulb ovate with brown tunics, produced along the long subterranean neck; stem short. Leaves rosetted, longer than the corymb, the lowermost usually a pair, lanceolate, tapering, the others oblong-lanceolate, less tapering. Pedicels short; perianth lilac, limb somewhat longer than the claw, oblong-lanceolate, obtuse, pellucid-dotted; filaments half as long as the limbs; anthers oblong. — Flow. March.

Ma. ma. Matruqa on calcarious ground.

Also around the Dead Sea and Jordan Valley.

103. (3.) **Aloe** Linn.

Perianth cylindrical, straight or slightly curved; segments subequal, as long as or much longer than the tube, connivent except at the tip. Stamens 6, hypogynous, rarely longer than the perianth; filaments filiform; anthers oblong, versatile, dehiscing down the face. Ovary ovoid, 3-celled; ovules many in a cell; style subulate; stigma small, capitate. Capsule oblong-trigonous, loculicidally 3-valved. Seeds triquetrous or flattened, sometimes winged; testa black; albumen fleshy; embryo straight. — Caudex produced or obsolete. Leaves fleshy, very various in shape, margined with spines. Peduncle simple or forked. Flowers many, racemose, usually bright red or yellow, tipped with green; pedicels articulated at the tip; bracts scariosae, persistent.

Species 100, distributed through the Mediterranean regions, Tropical Africa, Cape, a few reaching Madagascar, Socotra, India and China.

245. **Aloe vera** L. Spec. Plant. I (1753), p. 321. — Boiss. Fl. Or. V, p. 329. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 153 no. 1069. — Sickenberg. Contrib. Fl. d'Eg., p. 297. — Perennial; stem short, thick, somewhat divided. Leaves sessile, crowded, lanceolate, erect-spreading, rather concave, spiny-toothed at the margin. Scape longer than the leaves, scaly, branched; racemes long, dense; bracts short-lanceolate, membranous, longer than the short pedicel; flowers pendulous, imbricated, yellow; anthers somewhat exserted. — Flow. March to June.

M. ma. Mex; Abukir; Etku. — **M. p.** Rosetta; Qatiya; El-'Arish. — Commonly planted everywhere in cemeteries and thence naturalized.

Origin from Tropical eastern Africa.

104. (4.) **Tulipa** Linn.

Perianth deciduous, segments six, oblong or obovate, always destitute of a nectariferous pore. Stamens 6, shorter than the perianth, hypogynous, filaments dilated at the base, tapering toward the tip; anthers fixed at the base. Ovary sessile, 3-celled; style 0; stigmas 3, short, reflexed, grooved. Capsule oblong or obovate. Seeds numerous, discoid. — Caulescent herbs, the bulbs with tunics, the flowers usually solitary, campanulate.

A genus of about 60 species in temperate Europe, North Africa and Western Asia.

246. **Tulipa montana** Lindl. in Botanic. Regis. XIII (1827) tab. 1106. — Boiss. Fl. Or. V, p. 192. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 150 no. 1036. — Baker in Journ. Linn. Soc. XIV (1873), p. 279. — Perennial, 20 to 40 cm high; leaves 3-4, oblong-lanceolate, 2 to 4 cm broad to linear-lanceolate, often falcate, wavy-margined. Perianth 6 to 10 cm broad, palish at the outer, crimson at the inner surface, segments ovate to ovate-oblong or obovate, acute or obtuse, sometimes cuspidate, with an oblong blackish spot at the base, surrounded by a yellow margin; stamens one third as long as the perianth; capsule oblong-cuspidate, 4 cm long, 1.8 cm broad. — Flow. March.

M. p. El-'Arish.

Also known from Armenia, Persia, Kurdistan and Afghanistan.

105. (5.) **Gagea** Salib.

Segments of the funnel-shaped perianth 6, connate at the base, flat, filaments 6, adnate at the base to the perianth, subulate, anthers ovate to oblong, fixed by the base, and perforated to receive the filament. Ovary 3-angled, 3-celled. Ovules numerous, in two rows at the central angle of cell, horizontal. Style subulate, 3-angled, stigma capitate, 3-lobed. Capsule membranous, sessile or stipitate. Seeds ovate, angled, or flattened. — Bulbous herbs with umbelled or corymbose flowers, perianth-segments yellow or green with yellow margins.

A genus of about 30 species in the northern temperate regions.

247. **Gagea reticulata** (Pall.) Schult. Syst. Veg. VII (1829), p. 552. — var. **tenuifolia** Boiss. Flor. Or. V (1884), p. 208. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 151 no. 1037. — Sickenberg. Contrib. Fl. d'Eg., p. 295. — Perennial; tunics numerous, produced into a more or less elongated, reticulated sheath; stem more or less

exserted from the sheath, 1-flowered or with 2—5-umbelled flowers. Leaves filiform, often circinnate recurved, crisp-puberulent, the upper somewhat whorled under the umbel; pedicels thickish, much longer than the flower; perianth-segments lanceolate, acute to acuminate, many-striate, green with yellow margins; filaments half as long as the perianth; capsule obovate-oblong, obtuse, two thirds as long as the perianth. — Flow. February to March.

M. ma. Montaza; Mex. — **D. a. sept.** Mouth of the Wady Dugla, Gebel Gharebûn.

Local name: Za'eytemâm.

Also known from the Sinai.

— var. **fibrosa** Boiss. Flor. Or. V (1884), p. 208. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 151 no. 1037. — Sickenberg. Contrib. Fl. d'Eg., p. 295. — Aschers.-Schweinf. Prim. Flor. Marmar., p. 670 no. 314. — Bulbs dense, fibrilliferous; culms very short, 2—3-flowered, sometimes 1-flowered. — Flow. March.

M. ma. Matruqa; Mariut; Ramle. — **M. p.** El-'Arish.

Also known from other parts of the Mediterranean region.

106. (6.) **Allium** Linn.

Perianth polyphyllous; segments 6, subequal, oblong or lanceolate, spreading or permanently connivent. Stamens 6, attached to the base of the perianth segments; filaments subulate or flattened, or tricuspidate; anthers oblong. Ovary globose, sessile or shortly stipitate, perfectly or imperfectly 3-celled; ovules usually 2 in a cell; style subulate; stigma minute. Capsule loculicidally 3-valved. Seeds triquetrous; testa black; membranous; albumen fleshy; embryo cylindrical. — Whole plant smelling of garlic. Rootstock bulbous or subrhizomatous. Leaves all radical, but often clasping the base of the stem for some distance. Flowers small, white or coloured, usually numerous, umbellate.

A genus of 250—300 species. Concentrated in the north temperate zone, one in South Africa.

A. Crommyum. Ovules 2, side by side in each cell.

I. (Porrum). Bulbs not arising from a rootstock. The inner three filaments tricuspid, the cusps filiform or setaceous, the lateral ones sterile, the intermediate one fertile, i. e. anther-bearing.

- a) Outer tunics of the bulb not separated into fibres.
 - 1. Leaves flat, not hollow 1. *A. ampeloprasum*.
 - 2. Leaves hollow 2. *A. sphaerocephalum*.
 - b) Outer tunics of the bulb at length separated into fibres.
 - 1. Perianth-segments obtuse, greenish-red with white margins . . . 3. *A. curtum*.
 - 2. Perianth-segments acute, white . . 4. *A. Barthianum*.
- II. (*Haplostemon*). Bulbs having a root-stock. Filaments all simple or the inner three rarely furnished with a toothlet at the base.
- a) Leaves hollow 5. *A. Cepa*.
 - b) Leaves not hollow
 - 1. Lower part of the scape sheathed with semiterete leaves. Valves of the spathe lanceolate, caudate, one at least usually longer than the umbel.
 - α) Tunics of the bulb not separating into fibres.
 - † Pedicels very unequal; perianth-segments oblong-linear; capsule ellipsoid. . . 6. *A. paniculatum*.
 - †† Pedicels equal or subequal; perianth-segments oblong-spathulate; capsule globose-depressed 7. *A. myrianthum*.
 - β) Outer tunics of the bulb at the length separated into fibres . . 8. *A. desertorum*.
 - 2. Base (and sometimes the whole) of the scape sheathed with flat leaves; perianth-segments more or less spreading. Spathe broad, short-caudate. Tunics of the bulbs never fibrous or reticulate.
 - α) Scape terete; bulbs ovate.
 - † Leaves glabrous.
 - * Leaves not tortuous.
 - Δ Perianth-segments acute; filaments as long as the perianth . . 9. *A. Erdelii*.

ΔΔ Perianth - segments
obtuse; filaments $\frac{1}{3}$
the length of the
perianth

10. *A. roseum*.

** Leaves tortuous. 11. *A. Blomfieldianum*.

†† Leaves beset especially at
the sheaths with appressed,
retorse, club-shaped pa-
pillae 12. *A. papillare*.

β) Scape triquetrous; bulbs glo-
bular. 13. *A. neapolitanum*.

B. Melanocrommyium. Ovules 3—10, in two
rows in each cell.

I. Bulb ovate, with white, membranous
tunics; perianth-segments oblong-linear,
at the length reflexed; filaments somewhat
longer than the perianth 14. *A. Aschersonianum*.

II. Bulb ovate with black, coriaceous tunics;
perianth-segments narrowly elliptic-
linear, not reflexed; filaments $\frac{1}{4}$ the
length of the perianth 15. *A. Crameri*.

248. (1.) **Allium ampeloprasum** L. Spec. Plant. I (1753),
p. 295. — Boiss. Fl. Or. V, p. 232. — Aschers.-Schweinf. Ill. Fl.
d'Eg., p. 151 no. 1042. — Perennial; 1 m high or more; bulb ovate,
tunics scarious; scape stout, leafy to the middle. Umbel many-
flowered, pedicels many times as long as the flowers; perianth pink
to purple, segments ovate-oblong, obtuse; the back more or less
scabrous; filaments a little longer than the perianth, the fertile cusp
of the inner three shorter than the sterile. — Flow. March to April.

M. ma. Mex; Alexandria; Ramle; Mandara. — **O.** Little Oasis.

Local name: basal-el-'afrīt (Ascherson.)

Widely distributed in southern Europe and western Asia.

249. (2.) **Allium sphaerocephalum** L. Spec. Plant. I (1753),
p. 297. — Boiss. Fl. Or. V, p. 236. — Aschers.-Schweinf. Ill. Fl.
d'Eg., p. 151 no. 1043. — Sickenberg. Contrib. Fl. d'Eg., p. 295. —
Perennial; 60 to 80 cm high; bulb usually having bulblets, and
membranous tunics. Scape leafy to the middle; spathe at length
lobed; umbel globular; the outer pedicels as long as the flower, the
inner ones longer; perianth purple to pink, ovate-campanulate,
segments ovate-oblong, obtuse, smooth or roughish along the keel;

the fertile cusp of the inner three filaments as long as the sterile or longer. — Flow. February to March.

M. ma. Alexandria not common; Mandara; Mex. — **M. p.** E-'Arish. Also known from Europe and the Orient.

— var. **viridi-album** (Tin.) Boiss. in Flor. Or. V (1884), p. 236. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 151 no. 1043. — *Allium viridi-album* Tineo Catal. Plant. Panorm., p. 275. — *Allium Ampelopsprum* L. var. *viridi-album* Schinz et Durand Consp. Fl. Afr. V, p. 357 (!). — Flowers white. — Flow. March.

M. ma. Alexandria, rare.

Also known from southern Europe.

250. (3.) **Allium curtum** Boiss. et Gaillardot in Boiss. Flor. Or. V (1884), p. 245. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 151 no. 1044. — Perennial; 50 to 70 cm high; bulb small, globular, with bulblets, and membranous tunics. Scape thick, about 3-leaved below, shorter than half-terete, leaves 2 mm broad; spathe membranous, valves 2—3, ovate, deflexed, very short; umbel globular-ovate, the lower pedicels very short, the upper at length twice to thrice as long as the flowers; perianth small, ovate, hemispherical-campanulate, segments ovate, obtuse, smooth, greenish-red with white margins; filaments somewhat exserted, the inner three lanceolate, ciliate, the fertile cusp thicker than the sterile, and a little shorter. — Flow. March.

M. ma. Alexandria; Mariut; on sandy hills near Ramle.

Also known from Syria and Palestine.

251. (4.) **Allium Barthianum** Aschers. and Schweinfurth in Primit. Flor. Marmaric. in Bull. l'Herb. Boiss. I (1893), p. 670. — Sickenberg. Contrib. Fl. d'Eg., p. 295. — About 30 cm high, glabrous; bulb oblong-ovate usually having bulblets; tunics fibrillous pale brown, reticulate. Scape stout, leafy to the middle. Umbel 20—40-flowered, conferte; spathe bivalve, valves ovate, shortly acuminate, reflexed, shorter than the inflorescence; pedicels unequal, twice as long as the campanulate flower; perianth-segments white, oblong-lanceolate, acute; stamens shorter than the perianth-segments, filaments glabrous, not dilatate at the base; anthers oblong, purple; ovary oblong; style as long as or a little shorter than the anthers. — Flow. March.

M. ma. Matruqa.

Also known from the Turkish Marmarica and Cyrenaica.

252. (5.) **Allium Ceba** L. Spec. Plant. I (1753), p. 431. — Boiss. Fl. Or. V, p. 249. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 151 no. 1045. — Perennial; bulb thick, globular, tunics membranous.

Scape tall, hollow, inflated and leafy near the base, leaves in two rows, shorter than the scape; umbel globular, many-flowered; pedicels 4—5-times as long as the flowers; spathe composed of 2—3, reflexed valves; perianth white, segments ovate-oblong, acutish; filaments longer than the perianth, connate with each other and the perianth at its base, and dilated, the outer toothless, the inner with a triangular, obtuse tooth on either side at the base. — Flow. April to May.

M. ma. M. p. N. d. N. f. N. v. O. D. a. sept. D. i. D. a. mer.
R. Cultivated everywhere and sometimes spontaneous.

Local name: basal.

A cosmopolitan pot-herb origin indigenous probably Central Asia.

253. (6.) **Allium paniculatum** L. Spec. Plant. ed. II (1762), p. 428. — var. **pallens** (L.) Boiss. Flor. Or. V, (1884), p. 260. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 151 no. 1047. — Sickenberg. Contrib. Fl. d'Eg., p. 296. — **Allium pallens** L. Spec. Plant. ed. II, p. 427. — Perennial, 50 cm to 1 m high; bulb ovate, the outer tunics membranous or parchment-like. Scape terete, stout, leafy above the middle; leaves narrowly linear, solid or hollow; valves of the spathe 2, oblong-elliptical at the base, tapering into a tail as long to several times as long as the umbel; umbel very numerous-flowered, contracted with unequal or subequal pedicels, nodding before flowering, several to many times as long as the perigonium; perianth white to flesh-coloured and pink, obconical-campanulate, segments connivent, oblong-linear, obtuse, sometimes apiculate; filaments subulate, connate with each other and with the perianth at the base, the sinuses without teeth, or rarely with a minute tooth; capsule ellipsoid, tapering at the base; style exserted. — Flow. March.

M. ma. Mariut; Mex. — **D. i.** Gebel Ekhfên near el-'Arish.

Also known from other parts of the Mediterranean region.

254. (7.) **Allium myrianthum** Boiss. Flor. Or. V (1884), p. 257. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 151 no. 1046. — Perennial, 50—60 cm high; bulbs ovate, the outer tunics brown, striate, the inner ones white, membranous. Scape terete, stout, leafy above the middle; leaves narrowly linear, not hollow; valves of the spathe 2, ovate-oblong at the base, tapering into a tail as long to several times as long as the umbel; umbel globose very numerous-flowered with subequal filiform pedicels, nodding before flowering, several to many times as long as the perianth; perianth white or greenish-white to flesh-coloured, obconical campanulate, segments oblong-spathulate, connivent, obtuse, sometimes apiculate; filaments subulate,

connate with each other and with the perianth at the base, longer than the perianth, the sinuses rarely with a minute tooth; capsule globose-depressed, trigonous; style exserted. — Flow. March to April.

M. ma. Alexandria, very rare.

Only known from Egypt.

255. (8.) **Allium desertorum** Forsk. Flor. aeg.-arab. (1775), p. 72. — Boiss. Fl. Or. V, p. 267. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 152 no. 1048. — Sickenberg. Contrib. Fl. d'Eg., p. 296. — Perennial; 15 to 30 cm high; bulb oblong, 10 to 30 cm long, the outer tunics thick, the inner ones netted-striate, at length divided into fibres. Scape striate, nodding at the tip before flowering, somewhat flexuous, with three leaves or less at the base; leaves slender, grooved, striate, longer than the scape; valves of the spathe membranous, red-nerved, oblong-ovate, suddenly contracted into a subulate cusp, longer than the umbel; umbel 5—20-flowered, pedicels diffuse, unequal, once and a half to thrice as long as the flowers; perianth campanulate, 5 mm long, segments oblong-lanceolate, white, glossy, red-keeled, acutish, somewhat recurved at the tip; filaments simple, three quarters as long as the perianth, dilated at the base, subulate at the tip; anthers yellow; style included; stigma capitate. — Flow. March to April.

D. a. sept. Wady Hof near Helwan; desert eastward from Cairo, not rare; Northern and Southern Galala. Wady Tin. — **D. i.** Desert-el-Tih.

Local name: Za'eytemâm.

Also known from Syria.

256. (9.) **Allium Erdelii** Zucc. in Abhandlg. Bayr. Akad. III (1837), p. 236 tab. V. — Boiss. Fl. Or. V, p. 269. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 152 no. 1049. — Sickenberg. Contrib. Fl. d'Eg., p. 296. — Aschers.-Schweinf. Primit. Fl. Marm., p. 672 no. 318. — Perennial; 20 to 50 cm high; bulb ovate-oblong, 1 to 1.5 cm long, the outer tunics leathery. Scape terete, leafy only at the base; leaves linear, folded, subulate-tapering, usually ciliate at the margin; spathe tapering, at length 3—4-lobed, somewhat shorter than the pedicels; umbel dense, hemispherical; pedicels as long as the flower to once and a half as long, at length elongated; perianth campanulate, 8 mm to 1 cm long, straw coloured, glossy, segments connate near the base, oblong-lanceolate, acute; filaments as long as the perianth, connate and dilated at the base, tapering-subulate; style longer than the stamens, somewhat capitate at the base. — Flow. April.

M. ma. Alexandria, rare.

Also known from Syria and Palestine.

— var. **roseum** Boiss. Fl. Or. V (1884), p. 270. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 152 no. 1049. — Sickenberg. Contrib. Fl. d'Eg., p. 296. — Flowers flesh-coloured or rose. — Flow. April.

M. ma. Mariut; Matruqa; Mex; Moutaza; not common. — **M. p.** El-³Arish; El-Grady.

Also known from Syria.

257. (10.) **Allium roseum** L. Spec. Plant. I (1753), p. 296. — var. **Tourneuxii** Boiss. Flor. Or. V (1884), p. 274. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 152 no. 1051. — Sickenberg. Contrib. Fl. d'Eg., p. 296. — Perennial, 20 to 50 cm high; bulbs ovate, 1 to 1.5 cm long, the outer tunics alveolate subrotundate, often perforate, leathery. Scape terete, leafy only at the base; leaves broad linear, flat, long-acuminate, denticulate at the margins, shorter than the scape; spathe ovate, at length 3—4-lobed, acuminate, somewhat shorter than the pedicels; umbel numerous-flowered, hemispherical; pedicels 2—3-times longer than the flower; perianth campanulate, 9 mm to 1 cm long, rose, segments not connate, ovate-oblong obtuse, sometimes denticulate at the tip; filaments $\frac{1}{3}$ the length of the perianth, subulate dilatate at the base; style longer than the stamens. — Flow. March to April.

M. ma. Abukîr; Matruqa, not common; Mandara.

Local name: tôm.

The variety is only known from these localities.

258. (11.) **Allium Blomfieldianum** Aschers. and Schweinfurth in Primit. Flor. Marmar. in Bull. L'herb. Boiss. I (1893), p. 671 no. 317 tab. XX. — Sickenberg. Contrib. Fl. d'Eg., p. 295. — Perennial, 8 to 10 cm high, glabrous; bulbs often having bulblets, ovate, with coriaceous tunics, subsquamose. Leaves 3—4, flat, 6—8 mm broad, linear, serrulate-scabrous at the margins and when young ciliate, in the upper part tortuous, not longer than the scape; umbel 20—30-flowered, dense; spathe ovate, at length 3—4-fid, acuminate; pedicels as long as the flower; perianth segments silvery-white, scarious, rotundate-ovate, obtuse, with a distinct middle vein, the inner-ones erect-connivent; filaments equal, shorter than the perianth-segments, elongate, anthers oblong, yellow; ovary turbinate-obovate, in the upper part depressed, as long as the style. — Flow. March.

M. ma. Matruqa, on the sandy coast.

Only known from this locality.

259. (12.) **Allium papillare** Boiss. Diagnos. Plant. Or., sér. I. fasc. XIII (1853), p. 27. — Boiss. Fl. Or. V, p. 271. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 152 no. 1050. — Sickenberg. Contrib. Fl.

d'Eg., p. 296. — Perennial, 20 to 30 cm high; bulb ovate, with rusty-coloured tunics. Scape thickish, ascending, the lower part leafy; leaves scarcely shorter than the scape, narrowly linear, folded, subulate-tapering, beset especially at the sheaths with appressed, retrorse, club-shaped papillae; spathe with ovate, cuspidate lobes, as long as the pedicels; umbel hemisphaerical, pedicels twice as long as the flowers; perianth white, 6 mm long, divisions ovate, obtuse; filaments about as long as the perianth, connate, triangular-lanceolate, tapering; style longer than the perianth. — Flow. March to April.

M. p. Qatīyia; Bir Mabruk; Nakhl-Abu-Eyta: el-Grady. — **D. i.** Wady-el-Arish, between Gebel Ekhhên and Gebel Halal.

Also known from Syria.

260. (13.) **Allium neapolitanum** Cirillo Plant. rar. regn. Neap. I (1788), p. 13 tab. IV. — Boiss. Fl. Or. V, p. 274. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 152 no. 1052. — Sickenberg. Contrib. Fl. d'Eg., p. 296. — Perennial, 50 to 60 cm high; bulbs globular, with scarious tunics. Scape triquetrous, leafy at the base; leaves lorate or broad-linear, often 2 cm broad, tapering; spathe 1-valved, ovate, tapering, shorter than the pedicels; umbel many-flowered, 5 cm to 10 cm broad, pedicels thrice as long as the flowers; perianth white, 1.5 cm broad, spreading, segments ovate-elliptical, obtuse; filaments half as long as the perianth, adnate at the base, lanceolate, subulate-tapering at the tip; style longer than the stamens. — Flow. April.

M. ma. Alexandria; Mex; Mariut; not common.

Widely distributed throughout the Mediterranean region.

261. (14.) **Allium Aschersoniaum** Barbey Herboris. au Levant. (1882), p. 163 tab. IV. — Boiss. Fl. Or. V, p. 283. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 152 no. 1054. — Sickenberg. Contrib. Fl. d'Eg., p. 296. — Perennial, 30 to 50 cm high; bulb ovate with white, membranous, fringed tunics. Scape thick, leafy below, leaves lorate-lanceolate, tapering, usually wavy, denticulate-scabrous at the margin, shorter than the scape; spathe 2—3-lobed, shorter than the umbel; umbel spherical, dense, pedicels twice to four times as long as the flower; perianth pink, segments oblong-linear, obtuse, at length reflexed; filaments white, united at the base, long tapering toward the tip, somewhat longer than the perianth. — Flow. March to April.

M. ma. Mariut; Marabu; Mex; Alexandria, not rare.

Also known from Syria.

262. (15.) **Allium Crameri** Aschers. and Boiss. in Boiss. Flor. Or. V (1884), p. 279. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 152 no. 1053. — Sickenberg. Contrib. Fl. d'Eg., p. 296. — Perennial, 30 to 50 cm high; bulb with black, coriaceous fringed tunics. Scape thick, leafy below; leaves 1 or 2, broadly lanceolate, erect-recurved, as long as the scape. at the margins narrowly membranous, fimbriate; spathe ovate. 2-valved, shorter than the umbel; umbel spherical, dense, pedicels equal thrice to four times as long as the flower; perianth rose, segments narrowly elliptic-linear, not reflexed, obtuse; filaments $\frac{1}{4}$ the length of the perianth, lanceolate, at the base connate with each other and the perianth; anthers oblong, yellow; ovary subglobose. — Flow. October.

M. p. Gebel Ekhhên: El-'Arish. — **D. a. sept.** Great Petrified Forest near Cairo.

Only known from Egypt.

107. (7.) **Nothoscordon** Kunth.

Perianth funnel-shaped, with a distinct tube and 6 subequal oblong spreading or ascending lobes. Stamens 6, included, uniseriate or biseriate near the throat of the tube; anthers versatile. Ovary sessile or stipitate; ovules many and superposed in a cell; style simple; stigma capitate. Fruit a membranous capsule. Seeds small, black, triquetrous. — Bulbous herbs, with narrow rather fleshy leaves and flowers in umbells.

A small genus of about 10 species, widely distributed in America, only one species in East-Asia.

263. **Nothoscordon inodorum** Ascherson and Graebner in Syn. Mitteleurop. Flor. III (1905), p. 167. — **Allium inodorum** Ait. Hort. Kew. ed. 1 (1789), p. 427. — ed. 2 (1811), p. 337. — **Allium fragrans** Vent. Deser. jard. Cels. (1800), p. 26. — **Nothoscordon fragrans** Kunth Enum. IV. (1843), p. 461. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 152, no. 1055. — Perennial; leaves broad-linear, above 1 cm broad, obtuse. Scape fragile, glabrous, above 20 cm long. Flowers 8—12 in an umbel, with two small lanceolate spathe-valves, on pedicels 2—3 cm long, the oblong lobes twice as long as the broadly funnel-shaped tube. Stamens included, uniseriate at the throat of the tube; filaments lanceolate. Ovary subsessile; ovules 10—12 in a cell; style exserted, 5 mm long.

M. ma. In all gardens: naturalized everywhere. — **N. v.** Naturalized everywhere.

Origin of Tropical America.

108. (8.) **Dipcadi** Medic.

Perianth gamophyllous; tube oblong; segments dissimilar, 3 inner shorter, connivent, truncate; three outer more or less distinctly caudate. Stamens 6, inserted at the throat of the perianth; filaments short; anthers oblong or linear. Ovary sessile, globose, 3-celled; ovules many, superposed; style subulate; stigma capitate. Capsule loculicidally 3-valved. Seeds compressed; testa black, membranous; albumen fleshy; embryo cylindrical. — Rootstock a tunicated bulb. Leaves all radical, usually linear. Inflorescence a loose raceme. Flowers usually small, greenish.

Species 40. Also many in Tropical and South Africa, a few in South Europe, India, and Madagascar.

264. **Dipcadi erythraeum** Webb. et Berth. Hist. nat. Canar. III, part 2 (1840—1850), p. 341. — Baker Journ. Linn. Soc. XI (1871), p. 400. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 152 no. 1056. — Uropatalum erythraeum Boiss. Fl. Or. V, p. 286. — Hyacinthus serotinus Forsk. Flor. aeg.-arab., p. 209. — Delile Ill. Fl. d'Eg., p. 2. — Perennial, 10 to 25 cm high; bulb ovate-conical, 2—4 cm long, tunics white. Leaves 3—4, as long as the scape or longer; raceme 6—12-flowered; pedicels very short, nodding, becoming erect in flower; bracts scarious, deltoid-lanceolate, tapering, twice to thrice as long as the pedicels; perianth greenish-yellow, 1.3 cm long, the outer segments hooded, ending in a recurved cusp; capsule sessile, 1.2 cm long, ovoid; seeds compressed; testa black membranous. — Flow. March.

M. p. Abu Mandur near Rosetta, not common; Qatiya; Kôm Mastara; Damietta, in sandy places; el-'Arish. — **D. l.** Pyramids of Gîza and Saqqâra; Beni Selâma; Kafr Hakim; Abu Roash near Cairo; Zâwiyet Dashûr, rare. — **D. i.** Es-Sâlihiya, in the desert; Ramses; Ismailia; Geneffa station; Bir Suez near Suez. — **D. a. sept.** Cairo: Abasiya; Gebel ahmar; Belbeys; Gebel Shalûf; Nefisha; Wady et Tih; Wady Rished near Helwân.

Local name: bereyt; Za'eytemân (Forsk.).

Also known from Syria and Arabia.

109. (9.) **Urginea** Steinh.

Perianth polyphyllous; segments oblong, subequal, spreading, with a 1- or 3—5-nerved brown keel. Stamens 6, shorter than the perianth, attached to the base of the perianth-segments; filaments filiform or slightly flattened; anthers 6, small, versatile. Ovary sessile, ovoid; ovules several in a cell, superposed; style subulate;

stigma small, capitate. Capsule deeply 3-lobed, loculicidally 3-valved. Seeds flat, uniseriate; testa membranous, black or brown-black; albumen fleshy; embryo cylindrical. — Rootstock a tunicated bulb. Leaves linear or terete, often not developed with the flowers. Inflorescence racemose; bracts membranous, usually, especially the lower, spurred at the base. Flowers whitish, never bright blue.

Species about 40—50. Also in Tropical and South Africa and India.

- A. Leaves wavy-sinuate, 8 to 10 cm long; pedicels as long as the perianth; filaments as long as the perianth 1. *U. undulata*.
- B. Leaves not wavy-sinuate, 40—60 cm long; pedicels twice as long as the perianth; filaments shorter than the perianth 2. *U. maritima*.

265. (1.) **Urginea undulata** (Desf.) Steinh. in Ann. sc. nat. ser. 2, I (1834), p. 330. — Baker in Journ. Linn. Soc. XIII (1873), p. 220. — Boiss. Fl. Or. V, p. 223. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 151 no. 1039. — Sickenberg. Contrib. Fl. d'Eg., p. 295. — Perennial, 20 cm high; bulb 3 cm in diameter. All the leaves radical, appearing after the flower, spread over the ground, linear, grooved, wavy-sinuate, 8 to 10 cm long. Scape slender, erect, much longer than the leaves; raceme loose, 10 cm long; pedicels ascending, as long as the perianth, with a linear, somewhat spurred bract, half their length; perianth pale pink, segments ligulate, obtuse, adnate at the base, 1 cm long; filaments as long as the perianth; capsule ovate, triquetrous, 6 mm long; cells 3—4-seeded. — Flow. September.

M. ma. Abusîr; Alexandria; Mex; Mandara. — **M. p.** Etku; El-'Arish. — **D. a. sept.** Bîr-el-Fakhme; Gebel Garebûn; Great Petrified Forest; Wady-el-Abiad, Northern Galala.

Also known from all other parts of the Mediterranean region.

266. (2.) **Urginea maritima** (L.) Baker in Journ. Linn. Soc. XIII (1873), p. 221. — Boiss. Fl. Or. V, p. 224. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 151 no. 1040. — Sickenberg. Contrib. Fl. d'Eg., p. 295 (inclus. variet. minus Sickenberg.). — *Scilla maritima* L. Spec. Plant. I, p. 308. — Perennial, bulb 5 to 10 cm or more in diameter, tunics red. All the leaves radical, appearing in winter after the flowers, erect, long-lanceolate, often 40 to 60 cm long and 3 to 8 cm broad. Scape 1 m or more high, glaucous, stout; raceme long, dense; pedicels twice as long as the flowers, twice to thrice as long as the linear-lanceolate bract; perianth white, segments ovate-oblong, obtuse, green-nerved; filaments a little shorter than the perianth; capsule ovate or obovate, 3-angled, the cells 3—4-seeded. — Flow. July.

M. ma. Marmarica; Abusîr, not common; Mariut; Mex; Alexandria; Ramle; Abukîr. — **M. p.** El-^cArîsh.

Local name: (name of the bulb): askîl; basal-el-fâr (Delile): basal-el-'onseyl; generally: buseyl.

A well known officinal plant of Mediterranean origin; in the environs of El-^cArîsh it is cultivated for making the edges of the fields, a practice descending from ancient times.

110. (10.) **Muscari** Tourn.

Perianth ovate or cylindrical, more or less constricted below the mouth, urceolate, with small, ovate-triangular, somewhat reflexed teeth. Filaments inserted at the middle of the tube, nearly as long as the versatile anther. Cells of the ovary 3, 2-ovuled, style filiform, stigma capitate. Capsule sessile, triangular, chartaceous. — Bulbous herbs with racemed or spiked flowers.

A small Mediterranean genus of about 40 species.

A. Perianth cylindrical-urn-shaped; filaments in two rows, distinct, somewhat distant. Ovary ovate.

I. Sterile flowers long pedicelled 1. **M. comosum**.

II. Sterile flowers short-pedicelled or sessile 2. **M. bicolor**.

B. Perianth obovate to globular-urn-shaped; filament in one row, or obscurely 2-rowed; ovary triquetrous.

I. Perianth oblong to oblong-cylindrical 3. **M. racemosum**.

II. Perianth ovate-globular, minute.

a) Leaves 2—3 narrowly linear, as long as the scape; flowers subsessile 4. **M. Letourneuxii**.

b) Leaves 5—8, linear-filiform, semiterete, grooved, shorter than the scape; pedicels as long as the flower 5. **M. parviflorum**.

267. (1.) **Muscari comosum** (L.) Mill. Gard. Dict. ed. VIII (1768) no. 2. — Baker Journ. Linn. Soc. XI (1871). p. 414. — Hyacinthus comosus L. Spec. Plant. I, p. 318. — Muscari Holzmanni Boiss. Fl. Or. V, p. 293. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 152 no. 1057. — Bellevalia comosa Heldr. in Atti Congr. Fir., p. 228. — Perennial, 30 to 60 cm high. Leaves linear to lorate-lanceolate, channeled, as long as the scape or sometimes longer, 6 mm to 2 cm broad. Raceme cylindric-conical, at length elongated; loose; pedicels horizontal; fertile perianth brown, as long as the pedicel or shorter; tassel of the sterile flowers short, corymbose, pedicels

3—6 times as long as the minute violet-flowers. — Flow. March to April.

M. ma. Abusîr; Alexandria, Mariut; Mex; Montaza; Ramle; Mandara; Abukîr; rare. — **M. p.** El-Arish.

Local name: Buseyl; meddâd-el-yerâ'a.

Also known from Middle and South Europe and all the other parts of the Mediterranean region.

268. (2.) **Muscari bicolor** Boiss in Flor. Or. V (1884), p. 294. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 152 no. 1058. — Sickenberg. Contrib. Fl. d'Eg., p. 296. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 672. — Perennial, bulbs ovate. Leaves 3—4, narrowly linear, channeled, flaccid, longer than the scape. Raceme short, ovate, loose; pedicels horizontal, capillary, somewhat shorter than the flower; perianth cylindric, pale-blue; sterile perianth sessile oblong-cylindrical, dark-blue. — Flow. March.

M. ma. Abusîr; Matruqa; Mariut; Abukîr.

Only known from these localities.

269. (3.) **Muscari racemosum** (L.) Mill. Gard. Diet. ed. VIII (1768) no. 3. — Balser in Journ. Linn. Soc. XI (1871), p. 416. — Boiss. Fl. Or. V, p. 295. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 152 no. 1059. — Hyacinthus racemosus L. Spec. Plant. I, p. 318. — Hyacinthus botryoides Viv. Fl. Lybic. Specim., p. 21. — Perennial, 20 to 40 cm high. Leaves linear, grooved at the upper surface, flaccid, spread out over the ground, longer than the scape. Raceme 3 to 4 cm long, ovate, dense; the uppermost flowers sterile, erect; pedicels of the sterile flowers spreading-recurved, shorter than the flower or as long; perianth deep-blue, nodding, ovate-oblong to urceolate, teeth white then blue, deltoid, reflexed; valves of the capsule nearly orbicular, retuse. — Flow. March.

M. ma. Alexandria.

Also known from Middle and South Europe, western North Africa and western Asia.

270. (4.) **Muscari Letourneuxii** Boiss. Flor. Or. V (1884), p. 299. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 152 no. 1060. — Sickenberg. Contrib. Fl. d'Eg., p. 296. — Perennial, bulbs ovate. Leaves 2—3 narrowly linear, flaccid as long as the scape. Raceme short, few-flowered, dense, flowers subsessile; perianth small, blue, broadly ovate, teeth white triangular, somewhat reflexed. — Flow. February.

M. ma. Mex; Abukîr, very rare.

Only known from these localities.

271. (5.) **Muscari parviflorum** Desf. Fl. Atlant. I (1798), p. 309. — Bak. Journ. Linn. Soc. XI (1871), p. 418. — Boiss. Fl. Or. V, p. 299. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 153 no. 1061. — Sickenberg. Contrib. Fl. d'Eg., p. 296. — Perennial, 20 to 30 cm high; leaves linear-filiform, semiterete, grooved, somewhat shorter than the filiform scape. Raceme 6—12-flowered, oblong-ovate, 2 to 3 cm long, loose; pedicels capillary, about as long as the flower; spreading; sterile flowers almost none; perianth pale-blue, sweet-smelling, ovoid-urceolate, 2 mm to 3.3 cm long, teeth of the same colour as the limb, ovate, recurved; capsule smaller than a pea, valves broader than long, obliquely nerved. — Flow. December to February.

M. ma. Bir Kreyr; Mex; Alexandria; Ramle.

Also known from Palestine and Syria.

111. (11.) **Hyacinthus** Tourn.

(Bellevallia.)

Perianth campanulate or tubular, with the mouth not constricted more or less deeply 6-cleft, with erect or somewhat spreading teeth. Filaments inserted near the throat or below the middle of the tube free above; anthers fixed by the middle of the back. Ovary 3-angled with 3, two-ovuled cells. Style elongated; stigma obtuse. Capsule of three, chartaceous or coriaceous cells; seeds not caruncled. — Bulbous plants with racemed or spiked flowers.

A genus of about 30 species in the Mediterranean region, tropical and southern Africa.

A. Pedicels 0; flowers sessile 1. **H. sessiliflorus**.

B. Flowers pedicelled.

I. Pedicels usually shorter than the flowers.

a) Plants 30 to 40 cm high; leaves 3—4;

perianth dusky violet; anthers violet 2. **H. mauritanicus**.

b) Plants 10 cm high; leaves 5—6; perianth

lurid; anthers blue 3. **H. flexuosus**.

II. Pedicels once to twice as long as the flowers 4. **H. macrobotrys**.

272. (1.) **Hyacinthus sessiliflorus** Viv. Flor. Lib. Spec. (1827), p. 21 tab. VII fig. 5. — Bellevallia sessiliflora Kunth Enum. Plant. IV, p. 311. — Baker Journ. Linn. Soc. XI (1871), p. 429. — Boiss. Fl. Or. V, p. 305. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 153 no. 1005. — Sickenberg. Contrib. Fl. d'Eg., p. 297. — Bellevallia aleppica Boiss. Diagn. Plant. Or. ser. 2, IV, p. 11. — Perennial; bulbs ovate, thickish. Leaves 2—3, lanceolate, reflexed, longer than the scape. Raceme oblong, dense, bracts scale-like; flowers sessile, tubular-campanulate;

perianth lurid, teeth ovate, acute, one-half as long as the tube; filaments lanceolate, longer than the violet anther; capsule ovate, depressed-globular. — Flow. December to March.

M. ma. Mariut; Mex; Alexandria; Ramle; Mandara. — **M. p.** El-^cArish; El-Grady.

Local name: bel-bûkh (Ascherson).

Also known from the Cyrenaica.

273. (2.) **Hyacinthus mauritanicus** (Pomel) Schinz and Durand in Conspect. Flor. Afric. V (1895), p. 387. — *Bellevalia mauritanica* Pomel Nouv. Mater. Fl. Alg. I, p. 254. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 153 no. 1062. — Sickenberg. Contrib. Fl. d'Eg., p. 296. — *Bellevalia trifoliata* Boiss. non Kunth. Fl. Or. V, p. 303. — Perennial, 30 to 40 cm high; bulb ovate, 2—3 cm long. Leaves 3—4, linear-lanceolate, 1 to 3 cm broad, longer than the scape, ciliolate or not ciliolate at the margin. Pedicels usually shorter than the flowers, spreading or nodding; perianth dusky violet, tubular-campanulate, 1 to 1.8 cm long, with greenish, ovate-oblong, obtuse teeth, one-fourth as long as the tube; filaments longer than the violet anthers; capsule orbicular, rounded at the tip. — Flow. March to May.

M. ma. Mariut; Alexandria. — **D. i.** Near Senhur, in the desert near lake Birket-el-Qurûn.

Also known from Syria.

274. (3.) **Hyacinthus flexuosus** (Boiss.) Baker in Journ. of Botany XII (1874), p. 8. — *Bellevalia flexuosa* Boiss. Diagnos. Plant. Orient. Ser. I fasc. XIII, p. 36. — Fl. Or. V, p. 303. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 153 no. 1064. — Sickenberg. Contrib. Fl. d'Eg., p. 297. — Perennial, 10 cm high; bulb globular to ovate, 1.5 cm to 3.5 cm long. Leaves 5—6, lanceolate, tapering at both ends, membranous-margined, denticulate-ciliate, often wavy, longer than scape. Scapes 1—4, ascending or flexuous; raceme ovate, 3 to 4 cm long in flower, 6 cm long in fruit, pedicels ascending, then spreading or nodding at the tip, shorter than the flower; bracteoles minute, deltoid, bifid; perianth lurid, tubular-campanulate, 8 mm long; teeth oblong, obtuse, half as long as the tube; filaments triangular-lanceolate at the base, tapering, somewhat longer than the blue anther; capsule ovate-orbicular, acutely 3-angled, retuse at the tip, somewhat stipitate. — Flow. February to March.

M. ma. Ramle. — **M. p.** El-^cArish. — **D. a. sept.** Upper Wady Dugla; Mouth of the Wady Uarâq. — **D. i.** Desert-el Tih.

Local name: 'onsol (Wilkins.); ersey1; 'aïsalân (Schweinf.)

Also known from Sinai and Syria.

275. (4.) **Hyacinthus macrobotrys** (Boiss.) Baker in Journ. Linn. Soc. XI (1871), p. 433. — *Bellevalia macrobotrys* Boiss. Diagnos. Plant. Orient. Ser. I fasc. 13, p. 35. — Boiss. Fl. Or. V, p. 303. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 153 no. 1063. — Perennial, 20 to 35 cm high; bulb ovate, 5 cm long. Leaves 3—5, linear-lanceolate, often 2 to 3 cm broad, acute (margin membranous, obsolete scabrous) longer than scape. Raceme loose, cylindrical, 10 cm long in flower, 20 to 30 cm in fruit; pedicels once to twice as long as the flowers, spreading, in fruit recurved; bracts minute, triangular-ovate; perianth bluish to whitish or livid, tubular-campanulate, 8 mm to 10 cm long, teeth oblong, obtuse, one-third as long as the tube; filaments triangular, somewhat shorter than the rust-coloured anthers; capsule ovate-triangular, 8 mm long, mucronulate valves obliquely nerved. — Flow. March to May.

M. ma. Alexandria, very rare.

Also known from Syria.

112. (12.) **Scilla** Linn.

Perianth polyphyllous; leaves subequal, oblong or linear-oblong, 1-nerved in the keel, spreading from the base or above it. Stamens 6, not longer than the perianth, attached to the base of the segments; filaments filiform; anthers oblong, versatile. Ovary globose or oblong, 3-celled, sessile or stipitate; ovules many, superposed, or 2 collateral; style subulate; stigma minute, capitate. Capsule loculicidally 3-valved. Seeds turgid; testa black or brown-black; albumen fleshy; embryo straight, cylindrical. — Rootstock a tunicated bulb. Leaves all basal, contemporary with the flowers. Inflorescence racemose; pedicels not articulated; bracts scarioscous, persistent. Flowers blue varying to white, mauve-purple or greenish.

Species about 100, spread throughout Europe, Asia, and Africa.

276. **Scilla peruviana** L. Spec. Plant. I (1753), p. 309. Aschers.-Schweinf. Ill. Fl. d'Eg., p. 151 no. 1041. — Viv. Pl. Libye. Spec., p. 20. — Bak. Journ. Linn. Soc. XIII (1872), p. 240. — *Scilla hemisphaerica* Boiss. Voy. bot. Espagne, p. 63. — Boiss. Fl. Or. V, p. 225. — Bulb large. Leaves broadly linear, ciliolate at the margins, longer than the scape. Raceme corymbose hemispherical, many-flowered, dense; pedicels longer than the flower, erect; bracts lanceolate, acuminate, as long as the pedicels or sometimes shorter; perianth violet or blue-violet; leaves lanceolate, obtuse; filaments blue shorter than the pistil; ovary oblong; ovules about 4 in each

cell; capsule ovate, mucronate; grains subglobose, rugose, not arillate — Flow. March.

M. ma. Abusir near Alexandria, rare.

Also known from Spain, and the other parts of northern Africa.

113. (13.) **Ornithogalum** Linn.

Perianth polyphyllous; segments oblong, obtuse subequal, spreading from the base, concolorous or furnished with a distinct 1-nerved keel. Stamens 6, hypogynous, shorter than the perianth; filaments often flattened; anthers oblong, dorsifixed, versatile. Ovary sessile, globose, 3-celled, ovules many, superposed; style subulate, as long as or longer than the ovary; stigma capitate, minute. Capsule loculicidally 3-valved, not deeply lobed. Seeds not compressed; testa black; albumen firm; embryo small. — Rootstock a tunicul bulb. Leaves all radical, contemporary with the flowers. Raceme elongated or corymbose; pedicels not articulated; bracts membranous, persistent, not spurred. Flowers usually white.

Species about 100. — Temperate and subtemperate regions of the Old World, concentrated in South Africa, one doubtful species Chilean. Only one species occurs in Egypt.

277. **Ornithogalum tenuifolium** Guss. Flor. Sic. Prodr. I (1827), p. 413, var. **trichophyllum** (Boiss. and Heldr.) Boiss. Flor. Or. V (1884), p. 219. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 151 no. 1038. — Sickenberg. Contrib. Fl. d'Eg., p. 295. — *Ornithogalum trichophyllum* Boiss. and Heldr. Diagnos. Plant. Orient. Ser. II, fasc. 4, p. 108. — Perennial, 10 to 30 cm high; bulb simple, ovate, 1 to 2 cm long. Leaves glabrous, setaceous, erect, grooved, nearly or quite destitute of a white band, as long as the scape or longer. Corymb few-flowered; pedicels spreading, the lower twice to five times as long as the flowers, and once to twice as long as the lanceolate-subulate bract; divisions of the perianth oblong to linear-oblong, with a green band as broad as the margin, the outer three obsoletely mucronulate; filaments half as long as the perianth; capsule obovate, somewhat retuse, the ribs acute, approximated in pairs. — Flow. February to March.

M. ma. Abusir: Mariut; Mex; Alexandria; Ramle; Mandara: Abukir.

Local name: basal-el-hanakh (Ascherson).

Also known from Syria.

114. (14.) **Asphodelus** Linn.

Perianth not cut down to the very base; segments 6, oblong, subequal, spreading from above the base. Stamens 6, shorter than the perianth, inserted at the base of the segments; filaments dilated and connivent at the base; anthers oblong, versatile, dehiscing longitudinally. Ovary sessile, globose, 3-celled; ovules 2 in a cell, collateral; style subulate, slightly declinate; stigma terminal, minute. Capsule loculicipally 3-valved. Seeds often solitary, angled; testa crustaceous, grey or black, rugose; albumen cartilaginous; embryo cylindrical. — Annual or perennial herbs. Rootstock not bulbous. Leaves all radical, subulate. Racemes simple or branched; pedicels solitary, articulated; bracts membranous. Flowers white; segments keeled with brown.

Species about 6, natives of South Europe and the Mediterranean region extending to Northern India, Nubia and Mauritius.

A. Leaves not fistulous, flattened-triquetrous.

Roots tuberous and gibbous; perennial . . . 1. **A. microcarpus**.

B. Leaves fistulous. Roots fibrous; monocarpic or perennial

I. Scape only one, simple or dichotomously branched; leaves with roughish margins, narrowly linear; pedicels jointed below the middle 2. **A. tenuifolius**.

II. Scapes 3—4, ascending outside of the rosettes of leaves, simple; leaves without roughish margins, subulate-linear; pedicels jointed near the base 3. **A. viscidulus**.

278. (1.) **Asphodelus microcarpus** Viv. in *Linnaea* I (1826), p. 500. — Boiss. *Fl. Or.* V, p. 313. — Aschers.-Schweinf. *Ill. Fl. d'Eg.*, p. 153 no. 1066. — Sickenberg. *Contrib. Fl. d'Eg.*, p. 297. — *Asphodelus ramosus* L. subsp. *microcarpus* Baker in *Journ. Linn. Soc.* XV (1876), p. 290. — Perennial; tubers spindle-shaped, 10—20 cm long, 1 to 2 cm thick; neck surrounded by bristly fibres. Leaves sword-shaped, 50 cm to 1 m long, 1—2 cm broad, tapering at the tip. Scape 1 or more, terete, solid. Racemes dense, spreading, paniced; pedicels erect, shorter than the flowers; perianth 2 cm broad, white, funnel-shaped, divisions oblong, obtuse, with a reddish or greenish keel; capsule obovate, 8 mm long. — Flow. February to April.

M. ma. Marmarica, everywhere; Abusir; Mariut; Mex; Alexandria; Ramle; Abukîr. — **M. p.** El-Arish.

Local name: befût; suaï; isuaï; basal-'onsol (Ascherson); 'onssul (Schweinf.).

Also known from South Europe and Asia.

279. (2.) **Asphodelus tenuifolius** Cav. in Ann. scienc. nat. III (1800), p. 46 tab. 27 fig. 2. — var. **micranthus** Boiss. Flor. Or. V (1884), p. 315. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 153 no. 1067. — Perennial, 20—50 cm or more long. Leaves narrowly linear, semiterete, tapering-subulate, shorter than the scape, with roughish margins. Scape simple or dichotomously branched; bracts triangular at the base, acuminate; pedicels jointed below the middle; flowers white, campanulate, segments 1.3 cm long, with a purple stripe; capsule 2 mm in diameter. — Flow. March to April.

M. ma. M. p. N. d. N. f. N. v. O. D. l. D. i. D. a. sept. D. a. mer. Everywhere common.

Local name: basal 'ansal (Ascherson); basal-esh-sheyân (Schweinf.); basal iblis (Mohammed); burâq (Forsk.); generally borwâq.

Also known from the Canaries, Spain, North Africa, Arabia, Nubia, Syria and Palestine, India and Mauritius.

280. (3.) **Asphodelus viscidulus** Boiss. Diagnos. Plant. Orient. ser. 1. fasc. VII (1846), p. 118. — Boiss. Fl. Or. V, p. 315. — Baker in Journ. Linn. Soc. XV (1876), p. 272. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 153 no. 1068. — Perennial, 20—25 cm high. Leaves subulate-linear, viscid, glabrous. Scapes 3—4, ascending outside of the rosetts of the leaves, simple, the naked portion shorter than the leaves, raceme few-flowered; bracts triangular, mucronate, one-half to one-third as long as the pedicel; pedicels jointed near the base; flowers white, segments 5—6 mm long, with a purple stripe; capsule 2—3 mm in diameter. — Flow. March to May.

M. ma. Mex; Alexandria; not common. — M. p. Kheyta.

Also known from Arabia and Syria.

115. (15.) **Asparagus** Linn.

Flowers polygamous or dioecious in the Egyptian species. Perianth campanulate, cut down to the base into 6 subequal biseriate segments. Stamens 6, hypogynous or attached to the base of the segments; filaments short, filiform or slightly flattened; anthers oblong, dorsifixed, dehiscing introrsely. Ovary ovoid, 3-celled; ovules 2—8 in a cell; style short; stigmas 3, recurved. Fruit a globose berry. Seeds often reduced to 1; embryo cylindrical; albumen horny. — Stem

herbaceous or woody, often climbing. Leaves minute, bract-like, often spinose. Cladodia usually fascicled, subterete or flat. Flowers usually axillary, rarely racemose.

Species about 120. spread throughout the Tropical and Temperate regions of the Old World.

A. Cladodia clustered 1. **A. officinalis.**

B. Cladodia usually solitary 2. **A. stipularis.**

281. (1.) **Asparagus officinalis** L. Spec. Plant. I (1753), p. 313. — Baker in Journ. Linn. Soc. XIV (1875), p. 598. — Boiss. Fl. Or. V, p. 335. — *Asparagus altis* Aschers. Flor. Prov. Brandenbg. I, p. 730. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 154 no. 1070. — Stems erect and much branched, usually 30—70 cm high in the wild state, attaining 1.20—1.50 m when cultivated, and elegantly feathered by the numerous clusters of the face subulate cladodia, about 1.25 cm long. Flowers small, of a greenish white, hanging on slender pedicels, 2 or 3 together in the axils of the principal branches, many of them with stamens only. Berries small, red, and globular. — Flow. February to March.

N. v. Cultivated everywhere in the gardens and often naturalized.

Local name: Kishk-el-almâs (v. Samson).

Found in maritime sands, or sandy plains, in central and western Asia, all round the Mediterranean, and up the western coasts of Europe to the English Channel.

282. (2.) **Asparagus stipularis** Forsk. Flor. aeg.-arab. (1775), p. 72. — Boiss. Fl. Or. V, p. 338. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 154 no. 1071. — Sickenberg. Contrib. Fl. d'Eg., p. 298. — *Asparagus aphyllus* L. — var. *stipularis* Baker in Journ. Linn. Soc. XIV (1875), p. 600. — *Asparagus horridus* L. Suppl. Plant., p. 203. — *Asparagus squarrosus* Schmidt Flor. Ins. Cap. Verd., p. 165. — Perennial; stems erect, intricately branched, climbing over hedges; branches angled-grooved. Lower leaves produced at the base into short prickles. Cladodia thick; 1.5—2 mm in diameter, solitary or sometimes 1—2 in a cluster, 1—5 cm long, spreading, prickly-tipped. Pedicels 1—2, once and a half as long as the flower; divisions of the perianth alike; berry a little smaller than a pea. — Flow. February to March.

M. ma. Matruqa; Mariut; Bîr Kreyr. — **M. p.** Brullus. — **D. i.** Gebel Ekhfeyn near El-'Arîsh. — **D. a. sept.** Great Petrified Forest near Cairo.

Also known from the Canaries to Syria.

— var. **brachyclados** Boiss. Flor. Or. V (1884), p. 338. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 154 no. 1071. — Cladodia 1 cm long or less. — Flow. January to March.

Local name: Serr; haliyûn.

M. ma. Matruqa; Abusîr; Mariut; Mex; Alexandria; Montaza; Mandara; Ramle; Abukîr. — **M. p.** Kala'at-el-Maadiya; Etku on sandy hills; Rosetta, not rare; Kôm Mastara; Damietta. — **D. a. sept.** Wady-et-Tih; Helwan.

Also known from Syria.

116. (16.) **Ruscus** Tourn.

Flowers dioecious. Perianth greenish, marcescent, 6-parted, the segments at length spreading, the interior narrower, covered in the bud. Staminate flowers: Stamens 3, connate into an ovate tubule, at the apex of which are three anthers with divergent cells. Pistillate flowers: Filaments connate in a tubule surrounding the pistil, destitute of anthers. Ovary sessile, 3-celled, with 2 ovules in each cell; style short, stigma capitate. Berry fleshy, generally 1-celled, 1-seeded. Seed nearly globular. — Erect shrubs, with minute, bract-like, scarious leaves and branches (phyllocladia or phyllodia) transmuted into leathery, persistent, veined, sessile, leaf-like bodies, horizontal, owing to a twist of the base. Flowers small, springing from the midrib of the lower surface of the phyllocladium.

A small European and North African genus.

283. **Ruscus hypophyllum** L. Spec. Plant. I (1753), p. 1474. — Boiss. Fl. Or. V, p. 341. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 154 no. 1072. — A rigid, dark green shrub; branches ascending or erect. Cladodia coriaceous, oblong or oblong-lanceolate acute. Flowers 3—5, short-pedicelled, inserted below the middle of the phyllodium, subtended by a firm bract from the midrib; berry 1 cm in diameter. — Flow. March to April.

Local name: Kafan dar; hall-en-nâr.

M. p. Rosetta; Damietta. — **N. d.** Cultivated and often naturalized. Also known from Europe and other parts of the Mediterranean region.

18. **Amaryllidaceae.**

Usually perennial herbs, sometimes of large size. Rootstock bulbous, tuberous, tufted or creeping. Leaves generally all radical, narrow, not usually equitant or distichous. Flowers regular or slightly irregular, bisexual, in terminal umbels or racemes or panicles,

rarely solitary; peduncles or scapes naked or bracteate. Perianth superior, petaloid; tube long or short, limb 6-lobed or-partite, sometimes bearing at the throat a petaloid corona (Narcissus). Stamens 6, inserted on the perianth-tube or at the base of the segments and opposite to them; filaments free or united at the base; anthers 2-celled, versatile, introrse. Ovary inferior, 3-celled; style filiform or columnar, stigma simple or 3-fid; ovules numerous, in 2 series in the inner angle of each cell, anatropous. Fruit usually a 3-celled capsule with loculicidal dehiscence, rarely an indehiscent berry. Seeds generally numerous, sometimes reduced to 1 or 2 in each cell; albumen fleshy; embryo small, axile.

A well known and widely distributed family. found in all warm and temperate countries, but (like the *Iridaceae*) decidedly rare in Asia. Genera 65, species under 700. It includes the American aloe (*Agave americana*), which can be applied to a wonderful variety of uses. Both it and other species of *Agave* are valuable fibre-plants, *Agave rigida* being the well-known sisal hemp. The ornamental species are very numerous, the principal genera being *Narcissus*, *Galanthus* (snowdrop), *Leucoium* (snowflake), *Hippeastrum*, *Amaryllis*, *Vallota*, *Crinum*, *Agave*, *Fourcroya*. The two genera, found in Egypt are widely diffused.

- A. Flower furnished with a corona between the perianth and the stamens 1. *Narcissus*.
 B. Corona none. Stamens appendiculate towards the base, often united in a distinct cup 2. *Pancratium*.

117. (1.) *Narcissus*.

Perianth hypocrateriform; tube varying from obconic to cylindrical; segments subequal, spreading, ascending or reflexed; corona gamophyllous, inserted at the throat of the tube, small or large, saucer-shaped, cup-shaped, or funnel-shaped. Stamens 6, inserted in the tube of perianth; filaments short or long; anthers erect, basifixed. Ovary 3-celled; ovules many, superposed; style filiform; stigma small, 3-lobed. Fruit a membranous capsule with loculicidal dehiscence. Seeds subglobose or angled by pressure; testa black. — Bulb with membranous tunics. Leaves linear or subulate, usually contemporary with the flowers. Flowers solitary or umbellate, erect or drooping, white or yellow, rarely green, vernal, rarely autumnal; spathe membranous, always 1-valved.

A well-defined and very natural genus, chiefly south European, not extending in to Asia beyond the Caucasus. and probably containing but few real species, although some botanists, availing themselves of the most trifling characters, observed chiefly in cultivated varieties, have proposed the breaking it up into 15 or more genera, with above a hundred species.

284. **Narcissus Tazetta** L. Spec. Plant. I (1753), p. 416. — Baker Handb. of Amaryll., p. 7. — Boiss. Fl. Or. V, p. 150. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 149 no. 1030. — Bulb 2—5 cm diameter. Leaves 4—6, linear, glaucescent, 30—40 cm long, 1 to 1.5 cm broad, bluntly keeled. Peduncle distinctly compressed, 30 to 35 cm long. Umbel usually 4—8-flowered in the type; longer pedicels equalling or exceeding the spathe. Perianth-tube cylindrical, greenish, 1.8 cm long; limb 2—3 cm diameter; segments pure white, obovate, imbricated, 1.8 cm broad; corona cup-shaped, lemon-yellow, entire, 4 mm long, 0.63—0.8 cm broad. Anthers and style just exerted from the tube. — Flow. December to March.

M. ma. Mariut, rare. — **N. d.** Damietta, naturalized.

Extends from Canaries and Portugal through the South of Europe to Syria, Cashmere, China and Japan. The principal concentration of various forms is in Italy and the South-east of France.

118. (2.) **Pancratium** Linn.

Perianth-tube elongated, cylindrical, dilated into a funnel at the top; segments linear or lanceolate, equal, spreading. Stamens inserted at the throat of the perianth-tube; filaments united in a conspicuous cup with an entire or bifid process between each of them; free portion short; anthers linear, versatile. Ovary 3-celled; ovules many in a cell, superposed; style long, filiform; stigma capitate. Capsule loculicidally 3-valved. Seeds black, angled by pressure. — Rootstock a tunicated bulb. Leaves sessile, linear or lorate. Peduncle solid. Flowers pure white, many or few in an umbel; pedicels generally short; outer spathe-valves 2, lanceolate.

Species about 16, widely spread through the subtemperate and tropical regions of the old Worlds.

A. Leaves at the base broadly scarious, dilated.

I. Inflorescence lateral 1. **P. arabicum**.

II. Inflorescence terminal 2. **P. Sickenbergerii**.

B. Leaves not scarious at the base.

I. Valves of the capsule acuminate 3. **P. aegyptiacum**.

II. Valves of the capsule emarginate 4. **P. maritimum**.

285. (1.) **Pancratium arabicum** Sickenberger in Contrib. Fl. d'Eg. (1895), p. 290. — Leaves at the base broadly scarious, dilated, more or less spirally tortuous. Inflorescence lateral; floral-spathe bipartite; spathe valves broadly ovate-lanceolate, acuminate, 4—5 cm long, 1.5 cm broad, when flowering all scarious; pedicels short a third of the length of the ovary. Perianth-tube green, cylindrical,

dilated only at the very top; segments broadly ovate-lanceolate, acuminate, reflexed; capsule-valves oblong-ovate. — Flow. August.

M. ma. Mex; Abukir. — **M. p.** On sandy hills, el-Arish.

Only known from this locality.

286. (2.) **Pancratium Sickenbergerii** Aschers. and Schweinfurth in Gartenzeitg. II (1883), p. 345. — Boiss. Fl. Or. V, p. 153. — Baker Handb. of Amaryll., p. 118. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 150 no. 1032. — Sickenberg. Contrib. Fl. d'Eg., p. 291. — var. α desertorum and var. β litorale. — **Pancratium mauritimum** var. *Cyrcinalis* Fig. Stud. Scient. sull'Egitto I, p. 213 and II, p. 500. — Bulb ovoid, 3 cm diameter, with a long neck. Leaves 3—6, linear, grey-green, a foot long, conspicuously spirally twisted, produced after the flowers. Peduncle much shorter than the leaves. Flowers 3—6 in an umbel; spathe valves 2, lanceolate. Perianth-tube 2 to 3 cm long, obconic in the upper third; segments lanceolate, as long as the tube. Staminal cup obconic, under 2 cm long, with a bifid deltoid teeth between the very short free part of each filaments; anthers linear-oblong. Style overtopping the stamens. — Flow. October.

M. p. El-Arish; el-Grady. — **D. i.** El-Qantara: Bîr-abu'l-arûq; Gebel Um-Kasheyba; Gebel Ekhfeyn near El-'Arish. — **D. a. sept.** Moritz-Valley near the Lyons Hill, S.E. of Cairo in desert region; Gebel ahmar; Great Petrified Forest; Gebel Sheshen; Wady Eshra; Mouth of Wady Djafara near Belbeys.

Local name: 'aisalân; batn-el-hayne; Zambaq.

Also known from Sinai.

287. (3.) **Pancratium aegyptiacum** M. Roemer in Synop. Ensat. (1847), p. 180. — Sickenberg. Contrib. Fl. d'Eg., p. 292. — **Pancratium illyricum** Forsk. Flor. aeg.-arab., p. 209 not Linn. — Bulb globose, 2—3 cm diameter, with a long cylindrical neck. Leaves 6—12, linear, 15—30 cm long, conspicuously spirally twisted, moderately firm, glabrous. Peduncle very short, moderately stout. Flowers 2—4 in an umbel; pedicels very short; spathe-valves large, ovate-membranous. Perianth-tube 10—12 cm long, dilated at the tip; segments linear, ascending, above 4 cm long. Staminal cup obconic, above 2.5 cm long, toothed between the short free tips of the filaments; anthers linear, 0.63 cm long. Style overtopping the anthers. Capsule-valves oblong, 2.5 cm long.

M. ma. Mex. — **M. p.** In the sandy coast and sand-hills near El-'Arish: Tell-el-Sheykh.

Local name: beledy Sûsan.

Only known from those localities.

288. (4.) **Pancratium maritimum** L. Spec. Plant. I (1753), p. 418. — Boiss. Fl. Or. V, p. 152. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 149 no. 1031. — Aschers.-Schweinf. Prim. Flor. Marm., p. 669. — Sickenberg. Contrib. Fl. d'Eg., p. 293. — Baker Handb. Amaryll., p. 118. — Bulb globose, 4—6 cm diameter, with brown tunics and a short neck. Leaves 5—6, linear, glaucous, persistent, finally 30—60 cm long. Peduncle moderately short, compressed, 30—75 cm long. Flowers 5—10 in an umbel; pedicels very short; outer spathe-valves 2, large, ovate. Perianth-tube greenish, 3—6 cm long, funnel-shaped in the upper quarter; segments linear, ascending, 20—30 cm long. Staminal cup obconic, 2,5 cm long, with deltoid teeth between the free tip of the filaments, which is only 0,63 cm long; anthers linear-oblong. Style reaching to the tip of the segments. Capsule-valves about 2,5 cm long and broad. — Flow. March.

M. ma. Râs-el-Kanâs; Matruqa; Mex; Montaza; Mandara; Abusîr.
— **M. p.** Brullus; El-Arish.

Local name: Sûsan; Buseyl.

Throughout the Mediterranean region from Spain to Syria.

19. Iridaceae.

Perennial herbs, with a tuberous or bulbous or creeping rhizome. Leaves usually all radical, narrow, equitant and distichous. Flowers bisexual, regular or obliquely irregular, solitary and terminal, or in spikes or corymbs or panicles, or clustered, enclosed within 2 spathaceous usually scarious bracts. Perianth superior, petaloid, marcescent; segments 6, in 2 series, imbricate. Stamens 3, epigynous or inserted on the outer perianth-segments; filaments free or united into a tube; anthers 2-celled, opening outwards. Ovary inferior, 3-celled; style filiform, usually 3-fid above; divisions stigmatic at the end, subulate or narrow or broad, sometimes petaloid; ovules numerous, in the inner angle of each cell, anatropous. Fruit a coriaceous 3-celled usually trigonous capsule, loculicidally 3-valved. Seeds usually numerous, albuminous; embryo short, cylindric.

A large family, comprising nearly 60 genera and about 700 species, dispersed over the whole world, but most abundant and varied in South Africa, plentiful in South Europe, not infrequent in America, comparatively rare in Asia. The family includes few useful species. Some are said to be purgative and diuretic, and the dried stigmas of the saffron (*Crocus sativus*) are a well-known dye and spice. Many of the species are cultivated in gardens on account of the beauty of their flowers, especially of the genera *Iris*, *Crocus*, *Ixia* and *Gladiolus*. The two Egyptian genera are widely dispersed.

- A. Flowers stalked, usually more than one to a spathe, often fugitive and opening one after the other. Style branches furnished with crests that overtop the anthers and transverse stigmas 1. **Iris**.
- B. Flowers spicate, not fugitive, never more than one to a spathe. Style branches simple. Perianth regular. Stamens equilateral 2. **Gladiolus**.

119. (1.) **Iris** Linn.

Perianth-tube cylindrical, long, short or obsolete; segments of the two rows more or less dissimilar in shape and size, the three outer (falls) obovate-cuneate, reflexed in the expanded flower; the three inner (standards) distinctly unguiculate, usually erect. Stamens inserted at the base of the outer segments of the perianth opposite the petaloid styles; filaments short; anthers linear, basifixed. Ovary 3-celled; ovules many in a cell; style branches petaloid, with a terminal stigma and two deltoid petaloid crests. Capsule oblong trigonal or hexagonal. Seeds globose. — Rootstock creeping or bulbous. Leaves distichous, linear or ensiform. Flowers very various in colour, one or few in a head; outer spathe-valves large, ovate, herbaceous or membranous.

The largest genus of the Iridaceae, has about 100 species, widely distributed throughout the north temperate zone.

- A. Rootstock a short thick rhizome 1. **I. Helenae**.
- B. Rootstock bulbous 2. **I. Sisyrinchium**.

289. (1.) **Iris Helenae** Barbey Herboris. au Levant (1880), p. 159 no. 841. — Boiss. Fl. Or. V, p. 132. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 149 no. 1028. — Baker Handb. Irid., p. 19. — Rhizome short, moderately stout. Leaves linear-complicate, pale green, very falcate, 6—8 cm long at the flowering time. Peduncle 1-headed, 6—12 cm long, bearing 2—4 short leaves. Spathes 1-flowered, 4—6 cm long; valves lanceolate, membranous, pale green; pedicel very short. Perianth-tube cylindrical, greenish, 3—4 cm long; limb 5—6 cm long, pale lilac, with fine red-brown veins; falls orbicular-cuneate, 2.5 cm broad, dark purple and velvety at the throat; standards 5 cm broad, orbicular, with a short claw. Style-branches 2.5 cm long; crests quadrate. — Flow. January.

M. p. Nakhel-Abu-Eyta; El-^cArish; El-Grady.

Also known from Palestine.

290. (2.) **Iris Sisyrinchium** L. Spec. Plant. I (1753), p. 59. — Boiss. Fl. Or. V, p. 120. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 149

no. 1027. — Sickenberg. Contrib. Fl. d'Eg., p. 289. — Baker Handb. Iridae, p. 43. — *I. aegyptiaca* Delile Fragm. Flor. Arab., p. 6. — Bulb edible, globose, 2.5 cm diameter; outer tunics entirely fibrous. Leaves 2, suprabasal, linear, arcuate, 15—50 cm long, strongly veined. Stem slender, terete, 15—30 cm long; heads 1—3, the lateral sessile. Spathes 2—3-flowered, 5—7 cm long; valves lanceolate, the outer subscariose at the flowering time; pedicels very short. Flowers fugitive, lilac. Perianth-tube slender, 2.5 cm long; limb 2—3 cm long; falls with an oblong blade, 1 cm broad, as long as the haft, with a faint yellow spot bordered with white in the centre; standards rather shorter, oblanceolate-unguiculate, 4—6 mm broad. Style branches under 2.5 cm long; crests large, lanceolate-deltoid. Capsule oblong-trigonal, 2—4 cm long, hidden by the persistent scariose spathe-valves. — Flow. February to March.

M. ma. Mariut; Bîr Burdan; Abusîr; Tâbiet-el-Agmi; Mex; Alexandria, rare; Sidi Gaber; Ramle; Mandara; Montaza. — **M. p.** Between Qatiya and El-'Arîsh in many places. — **N. f.** Adowa; Medinet-el-Fayûm; El-Edwa; Kôm-Fâris; Abûxa; Senhûr; Senûris; Tomia. — **N. v.** Feshn; Malatiya; Abû Girga; Minia; Roda; Siut; Ekhmîm; Kenc. — **D. l.** Beni Selâma; Kafr-Hakim; Abu Roash near Cairo; Pyramids of Gîza; Saqqâra. — **D. i.** Es-Sâlihiya, in deep sand; El-Ferdân; Ismailia; Wady-el-Arîsh. — **D. a. sept.** Birket-el-hadji; Belbeys; Mokattam; Wady et-Tih; El-Massara; Turra near Helwan; Bîr Suez; Suez, sandy places.

Local name: 'onsegl; busseyl; kheyta; Zambaq.

Also known from Portugal and Spain, through the Mediterranean region to Punjab.

— var. **monophylla** (Boiss. and Heldr.) Boiss. Flor. Or. V (1884), p. 120. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 149 no. 1027. — Sickenberg. Contrib. Fl. d'Eg., p. 289. — Leaf one, very narrow. Stem lower. Perianth dirty-yellowish. — Flow. March.

M. ma. Matruqa; Mex; Alexandria; Bîr-el-alid; Bîr-Matruq; Bîr Abu Mesruq; El-Arîsh.

Also known from Syria.

120. (2.) *Gladiolus* Linn.

Perianth-tube usually funnel-shaped; segments of the limb more or less unequal in shape and direction, oblong, spatulate or unguiculate, the upper of the outer row generally the largest. Stamens inserted at the throat of the perianth-tube, contiguous and arching; filaments short, free; anthers linear, basifixed. Ovary 3-celled; ovules many, superposed; style long, arcuate; stigmas

cuneate, entire. Capsule oblong, loculicidally 3-celled. Seeds globose or discoid, sometimes distinctly winged. — Rootstock a tunicated corm. Produced leaves distichous, superposed on the stem, generally linear or ensiform. Inflorescence spicate; flowers 1 to a spathe, sessile; spathe-valves linear or lanceolate. Flowers very various in size and colour.

Species 150 the most in Tropical and South Africa, the others spread through Central Europe and the Mediterranean and Oriental regions.

291. **Gladiolus segetum** Ker-Gawl. in Botan. Magaz. (1804), tab. 719. — Boiss. Fl. Or. V, p. 139. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 149 no. 1029. — Baker Handb. Irid., p. 200. — Corm globose, 2—3 cm diameter; tunics of matted parallel fibres, reticulated upwards. Produced leaves 3—4, ensiform 30—40 cm long, 15—18 cm broad, loosely unequally nerved. Stem 30—45 cm long. Spike loose, 6—10-flowered; outer spathe-valve green, lanceolate, 2—3 cm long. Perianth-tube curved, 6—8 mm long; segments 2—3 cm long, bright purple, obovate, obtuse; the upper 1.5 cm broad, with a short claw; the lateral shorter; the 3 lower as long, with a long narrow claw and white line down the keel. Anthers 1.5 cm long, exceeding the filaments. Capsule turbinate, 1.5 cm long, torulose when mature. Seeds brown, globose. — Flow. February to March.

M. ma. Mariut.

Local name: kheyta.

From Madeira and the Canaries through the Mediterranean region to Persia and Turkestan.

— var. **Guepini** (Koch) Boiss. Flor. Or. V (1884), p. 139. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 149 no. 1029. — *Gladiolus Guepini* Koch Flora XXIII (1840), p. 466. — This variety is only a sterile form with small perianth-segments. — Flow. March.

M. ma. Mariut.

Distributed throughout the Mediterranean region.

Scitamineae.

Generally large perennial herbs, with persistent rhizomes and large glabrous leaves with a well-developed sheath, a stalk and a simple pinnately-veined asymmetrical blade. Flowers often large and showy, bisexual, zygomorphic or assymetrical. Perianth in two trimerous whorls, petaloid or distinguished into calyx and corolla. Androecium derived from two trimerous whorls, stamens free; sometimes five, rarely six, are present and fertile, but in most cases only one is fertile, the others being represented by petaloid staminodes

of very various form, or absent. Ovary inferior, of three carpels, generally trilocular, with one to many ovules in each chamber. Style simple, stigma terminal. Fruit a berry or capsule, with few or numerous seeds. Endosperm small or absent; perisperm copious; embryo straight or curved.

20. Cannaceae.

Perennial herbs with large pinnately veined leaves and terminal inflorescences of showy flowers. Flowers bisexual, assymetrical. Perianth of two trimerous series, the outer sepaline, the inner petaline. Androeceum of a varying number of petaloid members, one of which bears a half-anther, while another forms the labellum. Ovary inferior, trilocular, with two series of anatropous ovules, at the inner angle of each chamber. Style petaloid, stigma terminal, oblique. Fruit a warty or weakly spinose trilocular many-seeded capsule. Seeds roundish, containing a copious starchy perisperm and a straight well-developed embryo.

Only one genus; species about 40, in the warmer parts of America.

121. *Canna* Linn.

Sepals 3, equal, free, lanceolate, persistent. Petals 3, equal, lanceolate, united in a tube at the base. Staminodia united in a tube at the base, which is adnate to the staminal tube; lobes petaloid; anther 1-celled, adnate to one-side of the petaloid lobe. Ovary 3-celled; ovules many in a cell; style adnate at the base to the staminal tube, linear, flattened; stigmatose at the tip; stylodia often also present. Capsule globose, densely echinate, indehiscent. Seeds subglobose; testa finally crustaceous; embryo straight, in the centre of the hard albumen. — Tall herbs, with leafy stems. Leaves broad oblong. Flowers in terminal racemes; bracts membranous. Outer staminodia 2—3, oblong-spathulate, petaloid, usually bright red or yellow, often spotted.

Species about 40, all but two natives of Tropical and Subtemperate America.

292. *Canna indica* L. Spec. Plant. I (1753), p. 1. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 149 and Supplem., p. 773 no. 1320. — Sickenberg. Contrib. Fl. d'Eg., p. 288. — Stem glabrous 1.20 to 1.80 m high. Leaves oblong, acute, green or tinged with brown, the lower 30 cm long, 8 to 15 cm broad. Racemes loose, terminal on the leafy stem, simple or forked; pedicels short; bracts small, ovate. Sepals oblong-lanceolate, green, 6 to 10 mm long. Petals

lanceolate, 3 cm long. Upper staminodia 3, oblanceolate, 5 cm long, bright red, distinctly emarginate; lip red-yellow, linear, distinctly emarginate. Fruit globose, 2.5 cm long. Seeds globose, black, smooth, 4 mm diameter. — Flow. March to June.

N.d. Mahmudiya-Canal near Alexandria, subspontaneous; Mehallet-er-rîb. — Cultivated in all the gardens of Lower and Upper Egypt.

Local name: simlin; bint-el-qunsul.

A Native of Tropical America.

Dicotyledones.

Stems exogenous, consisting of pith, wood and bark (endogenous in rare cases): pith of parenchymatous cells: wood in one or several layers surrounding the pith, traversed by medullary rays; bark covering the wood. Leaves various: blades mostly pinnately or palmately nerved, their bases, or the bases of the petioles articulated. Perianth and essential parts of the flower rarely in threes or sixes. Embryo with two cotyledons (rarely with only one, or none). The first leaves (cotyledons) are opposite.

- A. Petals separate and distinct from one another or entirely wanting **Archichlamydeae.**
 B. Petals united **Metachlamydeae.**

Archichlamydeae.

Choripetalae.

Flowers with both calyx and corolla. Petals free, distinct, rarely wanting or connate at the base.

Salicales.

Dioecious shrubs or trees, with soft weak wood and bitter bark. Leaves alternate, with or without stipules: blades simple, entire or toothed: inflorescence consisting of bracted catkins. Flowers solitary in the axils of the bracts. Perianth 0 or a gland or a cup-shaped disk. Staminate flowers of 2 or more stamens: anthers introrse, innate. Pistillate flowers similarly disposed. Gynoecium of 2 or rarely 3—4 united carpels. Ovary 1-celled with 2—4 parietal placentae: stigmas 2—4, more or less divided and sometimes raised on a style. Ovules numerous. Fruit a dehiscent capsule. Seeds numerous, each bearing a coma. Endosperm wanting. Embryo straight.

21. Salicaceae.

Deciduous, dioecious trees or shrubs. Leaves alternate, base 3—5 nerved, stipulate. Flowers in catkins, one under each bract, ebracteolate; perianth 0; disk a scale or cupular or of glands; stamens 2 or more; filaments free or connate; ovary sessile or stipitate, 1-celled, style short or 0, stigmas short notched or lobed; ovules few or many on 2—4 subbasal or parietal placentas, erect, anatropous. Capsule ovoid or lanceolate, 2—4-valved. Seeds few or many, funicle with a pencil of long silky hairs, albumen 0; cotyledons plano-convex, radicle short inferior.

A family of only two genera, species about 180, chiefly N. temperate, usually preferring wet or damp places. The wood is light and soft, and the bark contains bitter principles (salicine and populine) used in the cure of intermittens as substitutes for quinine.

- A. Shrubs or trees, usually with oblong, lanceolate, or linear leaves, rarely obovate. Buds not covered with resinous varnish; disk of 1 or 2 separate glands . . . 1. *Salix*.
- B. Shrub or middle sized trees usually with oblong to ovate leaves (those of early and sterile branches often lanceolate to linear). Buds covered with a resinous varnish; disk cupular or annular 2. *Populus*.

122. (1.) *Salix* Tourn.

Catkins preceding or accompanying the leaves, with entire bracts, each flower with 1 or 2 small glands at the base. Stamens 2 (very rarely solitary or 2 the wholly connate, in some species 3 to 12); filaments filiform, free or more or less connate; anthers mostly yellow. Ovary and capsule more or less conical; stigmas short, entire or lobed. — Trees, shrubs or undershrubs, mostly confined to the neighbourhood of water; branches terete, buds covered with a calyptiform scale, and leaves mostly long and pointed, feather-veined.

A large and difficult genus of about 160 species, often very variable; about 60 species are North American, the remainder belonging to Europe and extra-tropical Asia, excepting half a dozen found in South America and South Africa.

A. Stamens 5—10.

- I. Scales round-ovate to oblong; leaves oblong-elliptical to lanceolate 1. *S. Safsaf*.

- II. Scales subspathulate; leaves broadly ovate lanceolate 2. *S. tetrasperma*.

- B. Stamens 2—3 3. *S. babylonica*.

293. (1.) **Salix Safsaf** Forsk. Flor. aeg.-arab. (1775), p. LXXVI. — Boiss. Fl. Or. V, p. 1183. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 142 no. 988. — *Salix Safsaf* var. *sericea* Sickenberg. Contrib. Fl. d'Eg., p. 280. — *Salix subserrata* Willd. Spec. Plant. IV, p. 671. — Shrub or tree, with reddish brown branches. Catkins straight, on leafy peduncles, cylindrical, 2—3 cm long; scales pale, deciduous, of one colour, round-ovate to oblong, villous; stamens usually eight, filaments villous at the base; capsules nearly globular, crowded, glabrous, borne on pedicels at length four times as long as the urn-shaped gland; style and stigmas short. Leaves at length coriaceous, oblong-elliptical to lanceolate, 1—10 cm long, 4 to 10 mm broad, serrulate to entire, glabrous on both sides or sometimes sericeous on the underside, paler at the lower surface; stipules on young twigs half-heart-shaped. — Flow. December to February.

M. ma. Mariut; Alexandria; way to Ramle; Mandara; Sidi Gâber; Abukîr, not common. — **M. p.** El-'Arîsh; Abu Zabel; Damietta; San. — **N. d.** Alexandria, along the Mahmûdiyya Canal; Damanhur; Tanta; Belbês; Cairo, sides of the Canal. — **N. f.** Medînet-el-Fayûm; Kafr Mukfût; Fidemin; Abuxa; Senhûr; Senûris; common. — **N. v.** Massara near Helwan; Helwan; Beni-Suêf; Minia; Siut; Gebel Silsele; Gebel Magaier; Tahta; Ekhmîm; Kene; Luksor. — **O.** Little Oasis: El-Qasr; Farâfra; Dakhel: 'Ain Sherif; Great Oasis: 'Ain Abdalla; Kharge. — **D. a. sept.** Serapeum.

Local name: safsâf beledy; generally safsâf.

Also known from Palestine and Syria.

294. (2.) **Salix tetrasperma** Roxb. Plant. Coromand. I (1795), p. 66 tab. 97. — Flor. Ind. III, p. 573. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 142. — A small tree, 6—12 m high, flowering after leafing; trunk stout; head large; branches suberect. Leaves petioled narrowly or usually broadly ovate-lanceolate acuminate serrulate, rarely entire usually glaucous beneath, glabrous or the young as well as the branchlets more or less softly tomentose or silky; petiole 1—2 cm long; stipules ovate or orbicular, deciduous. Catkins very slender, flowers in scattered clusters; male catkins 5—8 cm long, on leafy branchlets, sweet-scented; scales obovate or spatulate, pale, hairy; female catkins 6—10 cm long; scales smaller; stamens 5—10. Capsules long stipitate glabrous or puberulous, very variable in length and breadth; stigmas subsessile short entire; seeds 4—6. — Flow. December to January.

N. d. Subspontaneous on the sides of ditches near Alexandria, south of the Mahmûdiyya-Canal. — Cultivated in many Egyptian gardens.

Local name: bân.

Throughout Tropical and Subtropical India, from the Punjab eastwards to Assam and Munnipore, ascending the Himalaya to 2300 m, and southwards to Singapore; widely distributed in Java and Sumatra.

295. (3.) **Salix babylonica** L. Spec. Plant. I (1753), p. 1473. — Boiss. Fl. Or. IV, p. 1184. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 142. — Branches long, slender, recurved-drooping. Catkins short-peduncled, somewhat overtopped by the leaves of the peduncle, 2—3 cm long; scales lanceolate, straw-coloured, caducous; capsules sessile, ovate-conical, glabrous, pale-green; style nearly 0; stigmas divaricating, thickened, entire. Leaves narrow-lanceolate, long acuminate, serratulate, glabrous at both surfaces; stipules shorter than the petiole, awl-shaped. — Flow. March.

M. ma. Mahmûdiya-Canal near Alexandria, subspontaneous. — Cultivated everywhere in Upper- and Lower Egypt.

Local name: safsâf rûmy.

Also known from.

123. (2.) **Populus Tourn.**

Catkins preceding the leaves, pendulous, axillary, sessile or nearly so, the pistillate longest and loosely flowered; bracts lacerately toothed or fringed. Stamens few to many, inserted on the face of an obliquely truncate disk, with distinct filiform filaments and purple anthers. Ovary surrounded by a more or less cup-shaped disk: styles 2—4, often united at the base, lobed or divided. Capsule ovate-oblong to globose, 2—4-valved. — Trees with scaly and often resinous buds, caducous stipules, and glandular-crenate leaves.

A genus of about 20 species, of northern extra-tropical, equally divided between the Old and New Worlds. The wood is light-coloured, soft and light, durable if kept dry. The fragrant resinous balsam, which coats abundantly the buds of some species, is occasionally collected for medicinal use.

296. **Populus euphratica** Oliv. Voy. Emp. Othom. Egypt et Pers. III (1804), p. 449 fig. 45—46. — Boiss. Fl. Or. IV, p. 1194. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 142. — A tree, 3—4 m high (in Egypt), trunk attaining 2 m in girth. Leaves of young shoots 6 to 12 cm long and broad-linear or oblong entire and shortly petioled; of older parts 5—7 cm long, ovate-oblong, rhombic or orbicular, more or less lobed or cut, base cuneate rounded or cordate, 3—5-nerved; petiole 2—5 cm. Catkins loose-flowered; male flowers: bracts oblanceolate, incised; disk orbicular, 8 cleft; stamens 8—12;

female flowers: disk tubular, 8—12-cleft, membranous, caducous. Capsule large, 6,3—7 mm long, turgidly lanceolate. — Flow. March.

O. Little Oasis: 'Awêna.

Also known from Eastern Tropical and Northwestern Africa, Spain, Western and Central Asia and Syria.

Urticales.

Shrubs or trees with a hard wood, or herbs. Leaves alternate, or in the case of herbs often opposite; blades simple, entire, toothed or divided. Flowers various, nerves in catkins. Calyx present. Corolla wanting. Androeceium often of as many stamens as there are sepals. Gynoeceium of a single carpel or 2 united carpels. Fruit an achene, samara, drupe or syncarp. Endosperm usually scant or wanting.

22. Moraceae.

Shrubs or trees with a milky sap and often edible fruit. Leaves mostly alternate: blades entire, toothed or lobed; stipules deciduous. Flowers monoecious or dioecious, in catkin-like spikes or heads, on the outside of a receptacle, or on the inside of a closed, receptacle, the staminate with a perianth of 3—4-sepals, somewhat united at the base. Stamens 3—4, inserted at the base of the perianth. Filaments inflexed, straightening out elastically. Female flowers with a perianth of 3—5, partially united sepals which enlarge and envelop the achene at maturity and a 1—2-celled ovary. Styles or stigmas single or 2. Ovule solitary. Fruit a syncarp or syconium. Achenes inclosed in the pulpy calyx. Endosperm fleshy, or wanting. Embryo curved.

A large family, spread over the New and the Old World, chiefly tropical, but a few species extending into temperate regions, both in the northern and the southern hemisphere, a very few only to be met with in cold climates. A large number of the plants belonging to the Moraceae yield economic products, some of which, as the drug *Cannabis indica* obtained from *Cannabis sativa*, are extremely poisonous. *Hashish* or *Bhang* is a preparation made from the dried leaves, stems and flowers of the female plants and is smoked either alone or with tobacco, or chewed in combination with other substances, or an intoxicating drink is made from it, it being extensively used by the inhabitants of Arabia, Persia, India and most of the other oriental countries. The milk-juice of a number of plants belonging to the Moraceae is the source of arrow poisons. The milk-juice of quite a number of species of *Ficus* yields India-rubber or caoutchouc, as *Ficus elastica*

of the East-Indies, *Ficus toxicaria* of South America and several other species of Brazil. A large number of plants of the Moraceae yield edible fruits as the fig tree (*Ficus carica*), the Bread-fruit trees (*Artocarpus incisa*) of the Sunda Islands and the Yack-Tree (*Artocarpus integrifolia*) of the East-Indies, the White Mulberry (*Morus alba*) and the Black Mulberry (*Morus nigra*). The leaves of the white mulberry indigenous to China and cultivated since the twelfth century in Europe and now in cultivation to a limited extent in the United States, are the chief food of the silkworm.

A. Trees, with monoecious, dioecious, or polygamous flowers.

I. Fruit a compound drupe, resembling a blackberry . 1. **Morus**.

II. Fruit a fleshy receptacle containing the flowers . 2. **Ficus**.

B. Herbs, with monoecious or dioecious flowers 3. **Cannabis**.

124. (1.) **Morus** Linn.

Flowers monoecious or dioecious, arranged in spikes or heads. Male flowers: sepals 4; stamens 4, the filaments inflexed in bud. Female flowers: sepals 4—5, ovate, concave, at length becoming succulent, and enclosing the 2-celled ovary; stigmas 2; fruit a syncarpium, composed of the capitate-spiked, by abortion 1-seeded, fleshy sepals, which have become coalesced by pressure; testa of the seed hard, brittle; embryo hooked. — Trees with milky juice, and alternate leaves.

Species few, tropical and temperate.

297. **Morus alba** L. Spec. Plant. I (1753), p. 1398. — Boiss. Fl. Or. V, p. 1153. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 140 no. 984. — *Morus indica* L. Spec. Plant. I, p. 1399. — A tree 5—12 m tall, with a maximum trunk diameter of 1 m; roid orange coloured the twigs and young foliage sparingly pubescent. Leaf-blades ovate or oval-ovate, 6—15 cm long, acute or short-acuminate, singly or doubly serrate, sometimes lobed, rounded or cordate at the base, generally pubescent on and about the nerves beneath; petioles $\frac{1}{3}$ — $\frac{1}{4}$ as long as the blades, puberulent; male spikes 1—2 cm long, mostly longer than the peduncle; female spikes 0.5—1 cm long; syncarpium subglobose or oval-oblong, 1—2 cm long, usually longer than the peduncle, white pinkish or black. — Flow. December to January.

M. ma. M. p. N. d. N. f. N. v. O. Cultivated everywhere in the gardens and sometimes naturalized; very common.

Local name: tût beledy; generally tût.

Origin of temperate Asia.

125. (2.) **Ficus** Linn.

Flowers unisexual or pseudo-bisexual, rarely asexual, collected in various ways in more or less globose ovoid or pyriform concave receptacles which are closed at the tip by numerous bracteoles. Male flowers with 1, 2, or rarely 3 exserted or included ovate or oblong stamens, without rudimentary pistil, the perianth of 2—6 distinct pieces, or gamophyllous and 2—6 partite, or absent. Fertile female flowers with a single pistil and without rudimentary stamens, the ovary 1-celled with 1 pendulous ovule, the style more or less lateral, longer than the ovary and surmounted by the clavate cylindric peltate or bifid stigma, the perianth of 2—6 distinct pieces, or gamophyllous 2—6-partite, or absent; achenes more or less obovoid or reniform, rarely globular, with a minutely tuberculate or undulate hard pericarp, often with a glairy or mucilaginous outer coat; the seed pendulous, with small albumen; the embryo more or less curved. Gall flowers similar to the fertile females, but not containing embryos, and often occupied by the pupa of a species of *Blastophaga* or other Hymenopterous insect; the ovary ovoid or globular, its pericarp thin and membranous, or thick, brittle, and crustaceous; the style shorter than in the fertile female, often dilated above into a more or less trumpet-shaped false stigma. Male, gall and fertile female flowers collected usually on the same receptacle. Receptacles usually homorarely di-morphous, clothed at the mouth by numerous scales arranged in rows. — Trees or shrubs with milky-juice; leaves alternate, rarely opposite, stipulate, entire, serrate, dentate, or lobed; smooth hairy, or scabrid; the leaf-buds sometimes covered by deciduous leaf-scales.

A. Leaves deciduous.

I. Leaves pubescent or velvety at the lower surface 1. **F. carica.**

II. Leaves glabrescent-scabrous at the lower surface 2. **F. pseudosycomorus.**

B. Leaves persistent; figs on torulous, leafless twigs on the trunk or older branches . . 3. **F. sycomorus.**

298. (1.) **Ficus carica** L. Spec. Plant. I (1713), p. 1513. — Boiss. Fl. Or. V, p. 1154. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 140 no. 985. — Sickenberg. Contrib. Fl. d'Eg., p. 279. — Shrub or small tree, 3—5 m high. Leaves deciduous, petioled, scabrous at the upper surface, pubescent or velvety at the lower, ovate, cordate at the base, 3—5-lobed, repand, rarely undivided, 10—30 cm long and broad. Figs solitary, in or above axils on the branches, short

peduncled, pyriform to globular, tapering at the base to a stalk as long as Fig, or destitute of the stalk. — Flow. nearly all the year round.

M. ma. M. p. N. d. N. f. N. v. O. Common in the wild state, and cultivated without caprification in many selected varieties (cf. Appendix) for its usually sweet, sometimes somewhat acid fruit.

Local name: tîn.

Origin of the cultivation of the Fig tree is very ancient, and is now general from the islands of the North Atlantic eastward through the warm-temperate and subtropical regions eastwards to China. In Western Europe it extends northward to Britany and Normandy; and in Central Europe, according to Professor Ascherson, it reaches Hungary, where in the neighbourhood of Budapest the trees has run wild. Count Solms comes to the conclusion that the domestication of *Ficus carica* began in the Arabian peninsula and adjacent countries.

299. (2.) **Ficus pseudosycomorus** Decsne. Flor. Sinaic. (1841), p. 4. — Boiss. Fl. Or. IV, p. 1155. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 140 no. 986. — *Ficus virgata* Roxb. Fl. Ind. III, p. 530 (?). — Tree 3 m tall; young branches pruinose. Leaves deciduous, petioled, ovate to ovate-orbicular, cordate at the base, 5—15 cm long, obtuse, crenate-dentate or lobuled, some undivided, others repand to trilobed, green and scabrous at the upper surface, pall and tomentellous at length glabrescent-scabrous at the lower. Figs solitary on last year's branches, out of the axils, short peduncled or sessile, turbinate, puberulent. — Flow. March.

D. a. sept. Kene; Higâza, not common; Wady Natfe; Wady Abu-Hammât; Wady Tîn; Wady Dakhel; Medamôt near Karnak; Tûd, rare; Gebel Atâqa near Suez.

Local name: hammât (Wilkinson, Schweinfurth); dablût; zamiûk (Klunzinger).

Also known from Sinai, Syria and Palestine.

300. (3.) **Ficus Sycomorus** L. Spec. Plant. I (1753), p. 1059. — Boiss. Fl. Or. IV, p. 1155. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 141 no. 987. — Sickenberg. Contrib. Fl. d'Eg., p. 279. — Mildbraed and Burret: Die afrik. Art. d. Gattg. *Ficus* in Englers bot. Jahrb. XLVI (1911), p. 191. — *Ficus sycomorus vera* Forsk. Fl. aeg.-arab., p. 180. — *Ficus Chanas* Forsk. Fl. aeg.-arab., p. 219. — *Sycomorus rigida* Miq. in Hook. Lond. Journ. Bot. VII (1848), p. 110. — Tree 8 to 25 m tall and often 20 m broad. Leaves persistent, petioled, coriaceous, ovate-subcordate, 10—20 cm long, obtuse, entire, glabrous except the sparingly birtulous nerves of the lower surface. Figs disposed

in racemes on tortuous, leafless twigs on the trunk or older branches, turbinate, 2 cm long, short-stipitate, depresso-globose, tomentellous. — Flow. February to April.

M. ma. M. p. N. d. N. f. N. v. O. Cultivated everywhere and sometimes naturalized.

Local name: gimmeyz.

The tree is cultivated in Egypt and is identical with the Sycomore of Scripture. *Ficus Sycomorus*, or the Egyptian Fig seems to be invariably infested with the insect *Sycophaga crassipes* which is the same insect supposed to effect caprification in Malta, according to Rev. T. F. Marshall. This fig never produces ripe seed in Egypt, though it has been introduced from the earliest times. Not only are the ancient coffins made of the wood, but it was adopted as the sacred "Tree of Life". It probably came from Yemen, where Professor Dr. Schweinfurth saw many seedling trees grown spontaneously. The tree bears three crops per annum, in May, June and August-September. Boys cut off the top of the figs of the first two crops only. The figs have no pleasant favour until the operation has been performed, then the figs become very sweet, but remain smaller than when cut open. The object is to let the insect escape. Those that are left become watery and tasteless, and are full of namoos or sycophaga. The instrument used in Egypt for removing the "eye" or top of the sycomore fig is a kind of thimble made of iron plate ending in a spatula like a finger-nail. It is fixed on the thumb of the right hand. The operation is only made on fruits which shall be picked up the following day. The day after the operation the fig is quite ripe. The male flowers in those figs are all aborted, and the females have never perfect seeds. The figs of the third generation are larger, of an agreeable taste, and sweet-cented; but they are not operated upon, only because in August and September, though the trees are much fuller of fruit than in May and June, the people have so much to do at that time. They are seldom sold, and only eaten by the owners of the trees, or else they are abandoned to the field-mice, birds, and dogs, which latter are very fond of them. These nilg fruits are full of sycophaga. It is a very interesting fact, that Pliny also describes the process as closely corresponding with this modern method. He even uses a similar term "nail". (δνυχας): πέπτειν οὐ δύναται ἂν μὴ ἐπικνίσθῃ. ἀλλ' ἔχοντες δνυχας σιδηροῦς ἐπικνίφουσιν. ἃ δ' ἂν ἐπικνισθῇ, τετάρταια πεπτέται (Nat. Hist. XIII. 14).

Further the prophet Amos describes himself as "holas sigmim"; and the authors of the Septuaginta writing in Alexandria, appear to have understood the expression and translated these words by: This is the same verb as that which Pliny uses; so that it would seem to be pretty certain that Amos performed identically the same operation on the figs as is still done in Egypt at this day. It will be noticed that the idea was to ripen the figs.

— var. **citrina** Schweinfurth and Muschler var. nov. fruits oblong, light citrine.

N. d. Menzale; Damietta.

Local name: gimmeyz arabi.

The tree produces its fruit on the trunk and thick branches. It often serves for avenue purposes, on account of its spreading habit and the shade it gives. The fruit is eaten by the Arabs.

126. *Cannabis* Tourn.

Flowers dioecious. Male flowers racemed; sepals 5; stamens 5, inserted at base of sepals, filaments nodding, anthers pendulous, 2-celled. Female flowers spiked-clustered; the place of a perianth taken by a small, folded, persistent bract, inflated at base, enclosing the globular, 1-ovuled ovary; stigmas 2, elongated, filiform, pubescent, connate at base; nutlet ovate, erect, pericarp hard, brittle, apparently 2-valved but nearly indehiscent; embryo falcate-folded. — Annual herbs, with glutinous inflorescence. Leaves alternate or the lower opposite.

A small genus of only one species, in Central Asia wild; cultivated in temperate and tropical regions.

301. ***Cannabis sativa*** L. Spec. Plant. I (1753), p. 1027. — Boiss. Fl. Or. IV, p. 1152. — Aschers.-Schweinf. Ill. d'Eg., p. 139 no. 983. — A coarse erect herb, with a very tough inner bark. Stems branched, 1.5—2.5 m tall, rough pubescent, angled; leaf-blades divided in to 5—11 linear or linear-lanceolate serrate acuminate segments varying from 4—15 cm long; petioles 2—8 cm long; panicles about as long as the subtending leaves; calyx 4—5 mm broad, sepals oblong or oval, pubescent obtuse; stamens about as long as the sepals; spikes leafy-bracted, 1—2 cm long; achenes oval-lenticular, 4—5 mm long, variegated, envelopped in the persistent perianth. — Flow. February to March.

M. ma. M. p. N. d. N. f. N. v. O. Cultivated in gardens and sometimes subsontaneous.

Local name: sharâneq (Forsk.) shanâreq (Zarb) generally: bast.

Cultivated everywhere in temperate and tropical regions. The Hemp grows wild luxuriantly on the banks of the lower Ural and Volga near the Caspian Sea, probably also in the Lower Danle basin as far as Southern Hungary, extending thence to Persia, the Altai range, and Northern and Western China. It is found in Kashmir and on the Himalaya, growing 3 to 4 m high, and thriving vigorously at an elevation of 2000 to 3500 m. It likewise occurs in Tropical Africa, on the eastern and western coasts as

well as in the central tracts watered by the Congo and Zambesi, but whether truly indigenous is doubtful. In tropical countries the hemp-plant contains a resinous principle much used in oriental countries as a narcotic. Kharâneq consists of the leaves and stalks dried. It is smoked with tobacco or alone, and produces an exciting delirium or intoxication. Homer makes Helen administer to Telemachus, in the house of Menelaus, a potion prepared from „nepenthes, which made him forget his sorrows. This plant had been given to her by a woman of Egyptian Thebes; and Diodorus Siculus states that the Egyptians laid much stress on this circumstance, arguing that Homer must have lived among them, since the women of Thebes were actually noted for possessing a secret by which they could dissipate anger or melancholy. This secret is supposed to have been a knowledge of the qualities of hemp. The Arabic name „hashîsh“ would seem to be given in allusion to the green intoxicating liquor, and allied to this would appear to be the Hebrew shesh, a word supposed by some to be a name for flax, but may have rather been applied to hemp, since it literally means „to be joyous“. Persons who drink the draught are called „hashâshins“. Hemp is alluded to in the „Arabian Nights“ under its more ancient Arabic name „beng“.

23. Urticaceae.

Herbs (or in the tropics, shrubs or trees), with pellucid and watery, or firm tissues, sometimes armed with stinging hairs. Leaves alternate or opposite, blades simple, entire, toothed or rarely lobed, stipules usually present. Flowers small, greenish, dioecious, monoecious or polygamous, in axillary, simple or compound, often congested cymes. Calyx of 2—5 distinct or partially united equal or unequal sepals. Androecium of 2—5 stamens inserted at the base of the sepals or calyx lobes, reduced to staminodia in the female flowers, or none. Filaments distinct, strongly inflexed in the bud. Ovary superior, 1-celled. Style or stigma solitary, terminal or becoming lateral, the stigma often tufted. Ovule erect or nearly so, orthotropous or half-amphitropous. Fruit an achene. Endosperm oily, sometimes nearly wanting. Embryo straight, with broad cotyledons.

A very large family, chiefly tropical, of which the few Egyptian species give a very inadequate idea.

- A. Perianth of fertile flowers of 2—4, separate or nearly separate sepals. Herbs with stinging hairs 1. *Urtica*.
- B. Perianth of fertile flowers tubular or cup-shaped, enclosing the achene. Unarmed, perennial herbs 2. *Parietaria*.
- C. Perianth of fertile flowers 0, of male flower tubular, 1-lipped 3. *Forskålia*.

127. (1.) **Urtica**. Linn.

Flowers small, green, monoecious or dioecious in clusters arranged in axillary simple or branched racemes or panicles. Male flowers. Perianth deeply 4-partite; segments ovate or rounded, concave. Stamens 4, inflexed in bud. Rudimentary ovary cupuliform. Female flowers: Perianth deeply 4-partite; the two outer segments, smaller than the inner. Ovary straight, ovoid; stigma sessile or nearly so, penicillate; ovule solitary, erect, orthotropous. Achene ovoid or oblong, compressed, enclosed in the persistent perianth. Seed erect; albumen scanty, cotyledons rounded. — Annual or perennial herbs or small shrubs, more or less armed with stinging hairs. Leaves opposite, petiolate, toothed or lobed, 3—7-nerved; stipules lateral, free or comate.

Species 30 to 35, widely spread in the temperate and subtropical regions of both hemispheres, rarer in the tropics.

A. Femall flowers in axillary, interrupted racemes . 1. **U. urens**.

B. Female flowers in globular heads 2. **U. pilulifera**.

302. (1.) **Urtica urens** L. Spec. Plant. I (1753), p. 1396. — Boiss. Fl. Or. IV, p. 1146. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 139 no. 978. — Aschers.-Schweinf. Prim. Flor. Marm., p. 668. — Slender, erect or ascending, 15—50 cm high, with short lateral branchlets, leafy throughout, with scattered hairs or nearly glabrous; leaves thin, ovate or ovate-oblong, 2—6 cm long, coarsely and incisely toothed; stipules small, free; flower-clusters mainly female, usually shorter than the petioles or nearly sessile; fruiting sepals ovate, bispid on the margin, usually with a single lateral bristle; achene 2,5 mm long. — Flow. March.

M. ma. Brullus; Ed-Dakhêla; Mex; Hadra; Alexandria; Sidi Gâber; Ramle; Mandara. — **M. p.** Rosetta, everywhere a weed, margins of the desert; Fedmîn; Damietta, very abundant. — **N. d.** Rosetta; Damietta; Damanhûr; Tanta; Mansûra; Zaqaziq; Benha; Qalyûb; Cairo. — **N. f.** Medinet-el-Fayûm; Senûris; Senhûr; Tomia; El-Hammâm. — **N. v.** Beni-Suêf; Minia; Kene; Luksor; Aswân; everywhere as a weed in gardens. — **D. a. sept.** Gebel ahmar.

Local name: sha'ar-el-'agûz; khorêq; zaghlêle.

In cultivated and waste places, especially in rich herbs, throughout Europe and temperate Asia.

303. (2.) **Urtica pilulifera** L. Spec. Plant. I (1753), p. 1395. — Boiss. Fl. Or. V, p. 1147. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 139 no. 979. — An annual like the last, but coarser and taller, attaining 60 cm and very stinging. Leaves ovate or heart-shaped, deeply and regularly toothed. Male flowers in little, distinct clusters

along pedicels, often as long as the leaves; the females in globular beads, on the summit of a pedicel from 2—2.5 cm long. When in fruit these beads are 8—12 mm in diameter, and thickly beset with stinging bristles. — Flow. January to March.

M. ma. Ramle; Mariut; Alexandria; Abukir. — **M. p.** Damietta. — **N. d.** Not rare in gardens and fields as a weed. — **N. f.** Medînet-el-Fayûm.

Local name: fisa kelib Zorbe; goreys.

On roadsides, in waste places, in southern Europe. Further north only as an introduced weed in the neighbourhood of habitations.

128. (2.) *Parietaria* Tournef.

Flowers polygamous in axillary cymes or glomerules, sessile, bracteate. Male flowers (often bisexual): Perianth deeply 3—4-partite; segments valvate. Stamens 3—4, inflexed in bud. Female flowers: Perianth tubular, at the top 3—4-lobed; ovary free within the perianth; stigma recurved, penicillate; ovule solitary erect. Achene enclosed in the variously enlarged persistent perianth, crustaceous. Seed albuminous, cotyledons oblong or ovate. — Annual or perennial herbs. Leaves alternate, petiolate, quite entire, 3-nerved; stipules wanting.

A small genus of only 7 or 8 species, generally distributed in both temperate and tropical regions.

- A. Stems herbaceous, flaccid, leaves rounded at the base, ovate 1. *P. alsinifolia*.
- B. Stems indurated at the base, leaves wedge-shaped at the base, ovate-lanceolate 2. *P. judaica*.

304. (1.) *Parietaria alsinifolia* Del. Ill. Fl. d'Eg. (1813), p. 137 tab. 50. — Boiss. Fl. Or. IV, p. 1151. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 139 no. 981. — Annual. 20 to 30 cm high: stems filiform, puberulent, flaccid, diffuse. Leaves 3 to 10 cm long, rounded at the base, ovate or ovate-oblong. Cymes axillary, 3-flowered, the lower perfect, sterile with a lanceolate bract, the other two female with three cordate-ovate membranous bracts, 3 mm long in fruit, with connivent lobes. — Flow. March to April.

D. a. sept. Environs of Cairo, everywhere on calcareous ground, rare in sandy places; Mokkatam; Gebel ahmar, very abundant; Basatin; Wady Dugla; Ain Musa, near Cairo; Wady-Hof; Wady Abu-Marwa; Wady Khafura; Wady Senhur. — **D. a. mer.** Qoseyr: Hendôse in sandy places not rare.

Local name: Wudeyn-el-fâr; 'Adeyn-fâr.

Also known from Syria, Palestine and Persia.

305. (2.) **Parietaria judaica** L. Spec. Plant. I (1753), p. 1492. — Boiss. Fl. Or. IV, p. 1149. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 139 no. 980. — Sickenberg. Contrib. Fl. d'Eg., p. 278. — Perennial, 30 to 50 cm high, pubescent; stems more or less indurated at the base, diffuse or ascending, simple or branched. Leaves wedge-shaped at the base, ovate to ovate-oblong or ovate-lanceolate, more or less acute. Bracts connate at the base, somewhat decurrent; flowers in the forks female, the others perfect; perianth growing after flowering, at the length longer than the stamens. — Flow. February to April.

M. ma. Abusîr; Mariut; Alexandria-West; Mandara in great abundance; Ramle; Abukîr. — **M. p.** Rosetta. — **N. d.** Damanhur; Tanta; Mehallet-el-Kebîr; Mansura; Zifta; Zaqaziq; Qalyub; environs of Cairo everywhere in great abundance. — **N. v.** Siut; Ekkhmîm; Farshut; Luksor; Aswan.

Local name: Hashîsh-el-rîh.

Also known from South and Western Europe, Syria and Palestine.

129. (3.) **Forskalia** Linn.

Flowers monoecious, enclosed in an involucre of 4—6 leaves which are fleecy on their inner surface, the outer ones more numerous, male, the inner ones female; more rarely the female alone in 2-leaved involucre. Male flowers: Perianth tubular below, dilated above, 1-lipped, somewhat 3-toothed; stamen 1. Female flower: Perianth 0; ovary elliptical, fleecy, compressed, albumen little. — Perennial small herbs or shrubs, with alternate leaves, and free, lateral stipules.

A small genus of only 5 species, widely distributed throughout the Southern Mediterranean region from the Canaries to India.

306. **Forskalia tenacissima** L. Mant. Plant. (17), p. 11. — Boiss. Fl. Or. IV, p. 1151. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 139 no. 982. — Sickenberg. Contrib. Fl. d'Eg., p. 278. — Caidbeja adhaerens Forsk. Flor. aeg.-arab., p. 82. — Perennial, 10 to 80 cm high, appressed woolly and beset with hooked stinging hairs; stems simple or branching. Leaves ovate-orbicular to rhombic-ovate, 1—2 cm long, short petioled, cuneate at the base coarse-toothed toward the tip, green at the upper surface and white woolly at the lower. Involucre axillary, globular-turbinate, nearly sessile, 4—10 in a cluster, some with 4—5 lanceolate, acute silky-hispid involucre leaves, other with only 2. — Flow. December to March.

D. l. Near the Pyramids of Gîza in deep sand; Saqqara everywhere in great abundance. — **D. a. sept.** Tombs of the Khalifs; Gebel ahmar; Aïn Musa; Mekkattam; Wady Hof; Wady Abu-Shusha; Wady Rished in great abundance; Abassiye; Suez; Wady Khafura; Wady Waraq; St. Antony-Abbey; Wady Rosafa. — **D. a. mer.** Qoseyr: Hendôse.

Local name: Lussâq; lusseyq; nussâq (Schweinfurth; Muschler).

Also known from Arabia, Sinai, Syria and Palestine, Persia to North-western India.

Santalales.

Herbs or shrubs or trees, commonly parasitical on trees or on the roots of other plants. Leaves with expanded blades or often reduced to scales. Flowers perfect or imperfect, inconspicuous, variously disposed. Calyx present, often a mere border. Corolla present or wanting. Androecium mostly of as many stamens as are there petals or sepals, or twice as many. Gynoeceum compound more or less inferior. Fruit a drupe or a nut or a berry. Endosperm usually present, fleshy.

24. Santalaceae.

Herbs, shrubs or trees with entire leaves, without stipules. Flowers usually small, greenish or dusky-red or yellow. Tube of the perianth woolly or in part adnate, the limb 3—5-lobed, valvate in bud. Stamens as many as lobes and opposite to them, inserted at their bases or within the free part of the tube. Anthers 2-celled, opening lengthwise. Ovary wholly or in part adnate, 1-celled, with 3—5 ovules suspended from the tip of a free central placenta. Fruit an indehiscent nut or berry, with a single seed which is destitute of a proper seed-coat. Albumen fleshy. Embryo straight, with a superior radicle.

A family spread over the temperate regions of the whole world and the tropics of Australia and Polynesia.

130. Thesium Linn.

Flowers perfect. Perianth salver-shaped or funnel-shaped, 4—5-cleft. Disk indistinct. Filament inserted at the base of each lobe of the perianth bearded, linear. Anthers oblong, the splitting lengthwise. Ovary inferior; style filiform, stigma capitate; placenta filiform, erect with 3 ovules at the tip. Nut ellipsoid, caducous,

generally crowded with the calyx lobes. Seed 1, inverse. Embryo straight. Radicle superior. — Herbs sometimes shrubby at the base, flowers solitary in axillary or extra-axillary cymes.

A genus of about 115 species in the temperate regions and in the tropics of the world.

307. **Thesium humile** Vahl Symb. 111 (1794), p. 43. — Boiss. Fl. Or. IV, p. 1063. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 136 no. 954. — Sickenberg. Contrib. Fl. d'Eg., p. 274. — Annual or perennial; 10 to 30 cm high; stems numerous, erect, ascending, or spreading, striate-angled, densely, leafy, ending in a long, slender spike or raceme. Leaves linear, 1-nerved, serrulate-scabrous. Bract very long, bracteoles longer than the fruit; flowers 2 to 3 cm long; lobes of the perianth short-ovate; nutlet 2 mm long, ellipsoid, scarcely stipitate, umbonate with the short, connivent lobes. — Flow. March to April.

M. ma. Matrûqa; Mariut; Alexandria-west and Alexandria-east; Mandara. — **M. p.** El-'Arish. — **N. d.** Kafr Hawân; Sâlihiya; Ramses; Gassatîn. — **O.** Siwa; Farâfra; Dakhel; Great-Oasis.

Local name: Habb-el-areysh (Aschers.).

Also known from South Europa and the other parts of the Mediterranean region.

Polygonales.

Herbs, shrubs, trees or vines. Leaves alternate, or sometimes opposite or whorled; blades mostly entire; stipules mostly present, usually as a sheath. Flowers perfect; monoecious, dioecious, or polygamous, in variously disposed clusters. Calyx inferior, of 2—6 more or less united sepals sometimes developing keels or wings, often corolloid. Androecium of 1—9 stamens. Filaments often dilated at the base. Anthers 2-celled, opening longitudinally. Gynoecium 2—3 carpellary. Ovary superior, 1-celled. Styles 2 or 3, more or less united. Stigmas capitate or tufted, rarely 2-cleft. Ovule solitary, orthotropous. Fruit a lenticular or 3-angled achene, usually invested by the persistent calyx. Seed with incumbent or accumbent cotyledons.

25. Polygonaceae.

Herbs or shrubs or woody climbers. Leaves alternate or rarely opposite, simple, entire or serrulate. Stipules thin, scarious or membranous, forming a sheath round the stem. Flowers small, regular, usually bisexual, herbaceous or coloured, often jointed on the pedicel, clustered in the axills of the leaves or in spikes or

racemes, often forming terminal panicles. Perianth inferior, persistent; segments 4—8, free or, connate at the base, imbricate. Stamens 1—9 rarely more or less, hypogynous or perigynous; filaments capillary or subulate, free or connate at the base; anthers 2-celled. Ovary superior, compressed or trigonous; styles 1—3; ovule solitary, basal, orthotropous. Fruit a small hard indehiscent trigonous or compressed nut, usually enclosed in the persistent perianth. Seed erect, testa membranous; albumen copious, farinaceous; embryo variable in position, radicle superior.

A rather large family, spread over the whole world, but most abundant in the north temperate zone. Genera about 30, species over 600. The roots of many species are nauseous and purgative, the medicinal rhubarb being well known instance. On the other hand, the stems and leaves are frequently acid and refreshing, as the garden rhubarb and the common sorrel. Buckwheat is the only edible plant of any consequence. The Egyptian genera are widely distributed in both hemispheres.

- A. Achenes 2—4-angled-winged. Embryo in axis . . . 1. *Calligonum*.
- B. Angles of achenes wingless. Embryo lateral or peripheral.
 - I. Fruiting perianth triquetrous-urceolate, 6-toothed, outer 3 teeth spinescent 2. *Emex*.
 - II. Valves of fruiting perianth 3, larger than the outer 3 bract-like leaves, connivent 2. *Rumex*.
 - III. Fruiting perianth 4—5-parted, the inner 2—3 leaves larger 4. *Atraphaxis*.
 - IV. Fruiting perianth 4—5-fid or-parted, leaves nearly equal 5. *Polygonum*.

131. (1.) *Calligonum* Linn.

Flowers perfect. Perigonium rotate, petaloid, not growing, lobes 5, plano-concave, spreading. Stamens 10—16, connate at the base. Ovary 4-angled and-grooved; styles 4, free, short, stigmas capitate. Achene 4-winged, or else echinate, especially at the angles with 8—10 rows of branching, intertwined hairs, or covered with intertwined hairs expanded into a membrane enclosing the achene. Pericarp somewhat woody, seed 4-grooved. Embryo straight in the axis of fleshy albumen. — Much branched shrubs, the year old branches jointed, easily separated. Ochreae membranous, short bilobed. Leaves usually minute, soon deciduous. Flowers few, clustered in the axills of the ochreae, on the jointed pedicels.

A small genus of about 20 species, widely distributed in Asia and Northern Africa.

308. **Calligonum comosum** L'Herit. in Trans. Linn. Soc. London X (1811), p. 180. — Boiss. Fl. Or. IV, p. 1000. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 133 no. 930. — Perennial, 30 to 50 cm high, glabrous; branches white, tortuous. Leaves hardly 2 mm long, subulate, aduate to the ochreae. Achene ovate, bristles in 12—16 rows, branching, soft, dilated at the base, more or less jointed into 4, short wings. — Flow. March to April.

M. ma. Mariut; Alexandria, in deep sand; Bir Hammam; Mandara; Abukîr. — **M. p.** Damietta, in sandy fields; Port Said, on sandy hills common Qatiya and El-'Arish; Brullus. — **O.** Little Oasis; Farâfra; Dakhel; Great Oasis. — **D. l.** Abu roash; near the Pyramids of Gîza. — **D. i.** Bir-Abu-Ballah; Ramses, not rare; Sâlihiya; Bir Lebuk. — **D. a. sept.** Little and Great Petrified Forest; Khanka; Wady-Dakhel; Wady-Môr; Basatin; Wady Araba; Wady Ramlich-West; Wady Dugla; Mokkatam. — **D. a. mer.** Sherm Luliya.

Local name: Ghardaq; rosah; risu; generally: arta.

Widely distributed throughout Northern Africa.

132. (2.) **Emex** Neck.

Flowers monoecious-polygamous. Male: perianth herbaceous, 3—6-parted, lobes equal, spreading. Stamens 4—6. Female: perianth herbaceous, triangular-urn-shaped, 6-toothed, the outer three teeth at length spinescent, spreading, the inner connivent. Ovary triquetrous, with a basilar, erect ovule, and three penicillate stigmas. Achene free, enclosed in the calyx-tube. Seed erect, turbinate, triquetrous. Embryo peripheral around the mealy albumen, cotyledons leafy, radicle superior. — Annual, forked herbs, with truncate, torn membranous ochreae, and green flowers in axillary, leafless racemes or clusters, the lower female nearly sessile, the upper perfect or male, on filiform pedicels.

A small genus of only one species, distributed throughout the Mediterranean region, South Africa and Australia.

309. **Emex spinosus** (L.) Campd. Monograph. Rumex (1819), p. 58 tab. 1 fig. 1. — Boiss. Fl. Or. IV, p. 1005. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 133 no. 931. — Aschers.-Schweinf. Primit. Fl. Marmarie., p. 668. — Annual, 20 to 30 cm high, glabrous, usually many-stemmed from the neck, the lateral stems often decumbent. Leaves petioled, entire, cordate or truncate at the base, ovate to ovate-oblong. The inner teeth of the fruiting calyx ovate-triangular, 3-ribbed, the outer spinescent, usually recurved. — Flor. March to April.

M. ma. Dakala; Abusîr; Mariut; Matruqa; Alexandria-West; Mandara; Abukîr. — **M. p.** Qatîya; Rosetta. — **N. f.** Gharaq. — **O.** Siwa; Little Oasis Dakhel; Great Oasis. — **D. l.** Pyramids of Gîza. — **D. a. sept.** Basatin, Gebel ahmar; Qubba.

Local name: Figl-el-gebl (Forsk., Del.) Hanzab (Forsk.); rukbet-el-'agus; dirs-el-'agus (Aschers.); kulleyly; hommeyd (Schweinf.)

Also known from the other parts of the Mediterranean region, South Africa and Australia.

133. (3.) **Rumex** Linn.

Perennial or annuals herbs, very rarely shrubby. Leaves all radical and cauline, often cordate or hastate at the base, entire or toothed or almost pinnatifid. Flowers bisexual or less commonly unisexual, small, green, in axillary clusters or whorls, often forming simple or paniced racemes. Perianth-segments 6, the 3 inner enlarging and closing over the fruit, margins entire or toothed, midrib often tubercled. Stamens 6. Ovary 3-gonous, styles short, filiform; stigmas fimbriate. Nut 3-gonous, included in the enlarged inner perianth-segments, angles acute. Embryo lateral.

A large genus of over 100 species, found in all temperate and many tropical countries, and including several common weeds of cultivation.

A. Midrib of one or more of the leathery valves with a warty protuberance at the base, or to the middle. Styles free. Flowers perfect or polygamous.

I. Stems long, erect.

a) Valves ovate-oblong with 5—6 stiff, straight teeth on either side, shorter than the diameter of the valve . . . 1. **R. pulcher.**

b) Valves oblong-lanceolate, reticulate and with a usually large wart, and with 1—3, usbulate straight teeth on either side, as long as the width of the ovule.

a) Lower leaves ovate-spathulate to oblong-lanceolate, the upper linear . . . 2. **R. bucephalophorus.**

b) Lower leaves rounded or subcordate at the base, oblong, sometimes fiddle-shaped, obtuse, somewhat wavy . . . 3. **R. dentatus.**

II. Stems short or sometimes very short, proliferous . . . 4. **R. aegyptiacus.**

B. Midrib of the membranous valves often thickened into a deflexed scale at the base, margins entire. Flowers dioecious, rarely perfect-polygamous.

I. Leaves petioled, ovate-oblong in outline, pinnatifid or parted 5. *R. pictus*.

II. Leaves subcordate or subhastate at the base, ovate to deltoid 6. *R. vesicarius*.

310. (1.) **Rumex pulcher** L. Spec. Plant. I (1753), p. 477. — Boiss. Fl. Or. IV, p. 1012. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 133. — 50 to 100 cm high, glabrous or rough; stem erect, paniculate. Leaves small, the lower petioled, subcordate at the base, ovate to oblong or fiddle-shaped, the upper lanceolate. Racemes open, elongated; whorls remote, subtended by a linear-lanceolate leaf, pedicels short, jointed near the base, nodding; valves ovate-oblong, 4 mm long, with 5—6, stiff, straight, teeth on either side, shorter than the diameter of the valve; warts unequal in size.

O. Little Oasis.

Also known from Europe, all the other parts of the Mediterranean region and from Asia.

311. (2.) **Rumex bucephalophorus** L. Spec. Plant. I (1753), p. 479. — Boiss. Flor. Or. IV, p. 1014. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 668. — Annual, 10 to 30 cm high; stem simple or branching from the neck, erect or ascending, ending in long simple, slender racemes. Leaves petioled, the lower ovate-spathulate to oblong-lanceolate, the upper linear. Whorls somewhat approximated, 2—3-flowered; pedicels jointed at the base, at length club-shaped, reflexed, longer than the perigonium; valves with a minute wart at the deltoid base, oblong-lanceolate, with 2—4, spiny, straight or hooked teeth on either side toward the base, entire toward the tip. — Flow. March to April.

M. p. El-Grady (Ascherson).

Also known from South Europe, and the other parts of the Mediterranean region.

312. (3.) **Rumex dentatus** L. Mant. (1762), p. 226. — Boiss. Fl. Or. IV, p. 1013. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 133 no. 933. — *Rumex callosissimus* Meisn. in DC. Prodr. XIV, p. 57. — Annual, 30 to 60 cm high; stem simple or branched from the base. Leaves in the lower part of the stem petioled, rounded or subcordate at the base, oblong, sometimes fiddle-shaped, obtuse somewhat wavy. Whorls distinct, or more or less confluent, subtended by a linear-lanceolate, short petioled leaf, with cuneate base; pedicels shorter

than the fruit; valves oblong-lanceolate, 4 mm long, reticulate, all with a usually large wart, and with 1—3, subulate, straight teeth on either side, as long as the width of the ovule.

M. ma. Alexandria. — **M. p.** Rosetta; Damietta. — **N. d.** Everywhere on alluvial ground; Damanhur; Tanta; Zifta; Qalyub; Benha; Belbeys; Zaqaziq; Environs of Cairo. — **N. v.** Ekhnîm. — **N. f.** Medinet-el-Fayûm; Senûris; Senhur; Tomia. — **O.** Little Oasis; Farâfra; Dakhel; Great Oasis. — **D. a. sept.** Gebel ahmar.

Local name: Hommeyd; khille (Ehrenb.).

Also known from Syria.

var. **pleiodon** Boiss. Fl. Or. IV (1879), p. 1013. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 134 no. 933. — *Rumex strictus* Link Enum. Plant. Ber., p. 350. — *Rumex Ehrenbergii* Meibn. in DC. Prodr. XIV, p. 56. — *Rumex Klotzianus* Meibn. in DC. Prodr. XIV, p. 57. — Valves 3—5-dentate. — Flow. March to April.

M. p. Rosetta. — **N. d.** Damietta, Lake Menzale.

Also known from Arabia.

313. (4.) **Rumex aegyptiacus** L. Spec. Plant. I (1753), p. 477. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 134 no. 934. — *Rumex comosus* Forsk. Flor. aeg.-arab., p. 78. — Annual subcaulescent. Leaves petiolate cuneate at the base, the lower ones obtuse, the others lanceolate-linear. Whorls somewhat approximated, 2—3-flowered; pedicels jointed at the base, at length club-shaped, reflexed, longer than the perianth; valves triangulous acuminate reticulate, with 2—3 setaceous teeth on either side toward the base entire toward the top.

M. ma. Abusîr; Alexandria-West; Mandara; Abukîr. — **N. d.** Cairo; San; Sâlihiya; Damanhûr; Damietta, in fields. — **N. f.** Medinet-el-Fayûm; Birket-el-Qurûn. — **N. v.** Siut; Kene; Abu Girge; Girge; Beni-Suêf.

Local name: Hommeyd (Roth).

Only known from Egypt.

314. (5.) **Rumex pictus** Forsk. Flor. aeg.-arab. (1755), p. LXV no. 215 and p. 77. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 134 no. 935. — *Rumex lacerus* Balb. Miscell., p. 19. — Boiss. Fl. Or. IV, p. 1016. — Annual, 10 to 40 cm high, glabrous, branching from the neck; branches decumbent and ascending, forked. Leaves fleshy, petioled, ovate-oblong in outline, 2—4 cm long, pinnatifid or parted on either side into 1—4, ovate-triangular to oblong-linear, lateral lobes, the terminal oblong-triangular, crenate-lobed or dentate, obtuse or acute, the uppermost leaves lanceolate-linear, repand to entire.

Racemes axillary and terminal, leafless, loose; pedicels capillary; valves membranous, reticulate, reniform to cordate-ovate, 5 to 10 mm long, often deep red; scale oblong.

M. ma. Everywhere on sandy ground; Alexandria-West; Abukîr. — **M. p.** Rosetta; Bîr-Abu-Mesruq; Damietta. — **N. d.** Damanhûr; Zaqaziq; Cairo; San; Lake of Maqsama; Sâlihîya. — **N. f.** Birket-el-Qurûn. — **N. v.** Abu Girge; Girge; Beni-Suêf. — **D. i.** Sâlihîya; Suez; Between; Ismailia and Bîr Gebel-Ekhfen; El-‘Arish.

Local name: Hommeyd; khamseys (Schweinfurth).

Also known from Syria.

315. (6.) **Rumex vesicarius** L. Spec. Plant. I (1753), p. 336. — Boiss. Fl. Or. IV, p. 1017. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 134 no. 936. — Campd. Monogr. Rum. Tab. 3. — Aschers.-Schweinf. Prim. Fl. Marmaric., p. 667. — Stem herbaceous, branching at the base, rather fleshy, minutely papillose when dry, about 1, 7 to 2 cm long and 2.5 cm wide; petiole of lower leaves up to 3 to 4 cm long. Panicles terminal; peduncles slender, articulated about the middle, 1-flowered or with 2 terminal connate flowers; bracts about as long as the peduncles, lanceolate, scarious. Perianth-segments 9 to 10 mm in diameter in fruit, suborbicular, cordate at both ends, reddish, woody in the centre, membranous and reticulated on the wings, not nerved at the margins. Achene triquetrous or almost winged, acute, cream-coloured, 3 mm long.

N. d. Mahsama. — **N. v.** Thebes, on alluvial and often on sandy ground. — **O.** Little Oasis; Dakhel; Great Oasis. — **D. l.** Pyramids of Giza; Saqqâra-Pyramids. — **D. i.** Sâlihîya; Suez; Ramses. — Gebel Awchad; Little Petrified Forest; Wady Tîn; Wady Azhar; Gebel Magaîr between Siut and Girge. — **D. a. sept.** Mokkatam; Gebel ahmar not rare; Wady Riched; Wady Hof; Wady-abu-Shusha. — **D. a. mer.** Qoseyr; Between Okella Dauî and Bîr Taylis; Mirsa Zebâri; Wady Gadîre.

Local name: Hanbeyt; hansis; hamasrs; hamsis; hammâd generally; hommeyd.

Also known from the other parts of the Mediterranean region, Nubia and Somaliland.

var. **roseus** (L.) Schweinf.-Muschler comb. nov. — *Rumex roseus* L. Spec. Plant. I (1753), p. 480. — Boiss. Fl. Or. IV, p. 1017. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 134. — Only a variety of the foregoing species with oblong-deltoid to lanceolate leaves, and valves bordered by a nerve. — Flow. March to April.

D. a. sept. Suez; Wady Khafûra, northern Galala; Wady-Tin; Wady Dugla; Wady Hof.

Local name: Hommeyd.

Throughout the Mediterranean region.

134. (4.) *Atraphaxis* Linn.

Flowers perfect. Perianth petaloid, 4—5-parted, leaves imbricated, the outer unchanged, the inner ones growing in fruit, appressed to the achene. Stamens 6—8, filaments dilated at the base, inserted at the bottom of the perianth. Styles 2—3. Ovary lenticular or triquetrous, with crustaceous pericarp. Seed filling the cell, of the same shape, erect. Embryo incumbent in the angle of the albumen, radicle superior, cotyledons linear. — Shrubs often spinescent.

Species about 17, in Central Asia, North Africa and some parts of South Europa.

316. *Atraphaxis spinosa* L. Spec. Plant. I (1753), p. 475. — var. *sinaica* (Jaub. and Spach) Boiss. Fl. Or. IV (1879), p. 1021. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 134 no. 937. — *Atraphaxis sinaica* Jaub. and Spach Ill. Plant. Or. II, p. 12. — *Tragopyrum rotundifolium* Presl. Bemerk., p. 109. — Shrubby, 30 to 50 cm high; leaves 3 to 4 mm long, round-ovate. Perianth 4-merous; the outer two perianth-leaves ovate-orbicular, reflexed, the inner two cordate to reniform-orbicular, 5 mm long. Stamens 6; stigmas 3; achene lenticular. — Flow. March to May.

D. a. sept. Wady Om-Ruty, southern Galâla (Schweinfurth).

Local name: Sueyd; sawâs.

The variety is also known from Sinai.

135. (5.) *Polygonum* Linn.

Flowers small, bisexual, clustered; clusters either axillary or in racemes or spikes or panicles; bracts and bracteoles membranous, ochreate; pedicels usually jointed. Perianth 5-partite, green or coloured; segments equal or the 2—3 outer ones the largest. Stamens 5—8. Ovary compressed or trigonous; styles 2 or 3, free or connate at the base, stigmas usually capitate. Nuts compressed or trigonous, included in the persistent perianth. Seed albuminous; embryo excentric or lateral; radicle long, superior. — Herbs or rarely shrubby at the base. Leaves alternate; stipules membranous, usually tubular and closely sheathing the stem.

A large and almost cosmopolitan genus, including over 150 species.

A. Flowers in heads or clusters.

I. Annuals.

a) Nutlets rugose, dull.

1. Branches erect 1. *P. Bellardi*.
 2. Branches prostrate or procumbent 2. *P. aviculare*.

b) Nutlets smooth, shining 3. *P. plebejum*.

II. Perennials.

a) Leaves green, oblong-lanceolate, margin rather wavy, the floral as long as the flowers or a little longer

5. *P. equisetiforme*.

b) Leaves glaucous, elliptical, revolute margined, the floral much longer than the flowers

4. *P. maritimum*.

B. Flowers in spikes, racemes or in panicles.

I. Racemes elongated, slender, clusters of flowers not congested.

a) Perennial; stems prostrate 6. *P. serrulatum*.

b) Annual.

1. Stems erect 7. *P. persicaria*.2. Stems climbing 8. *P. Convolvulus*.

II. Racemes elongated, more robust; clusters of flowers congested.

a) Ochreae with a herbaceous spreading limb

9. *P. limbatum*.

b) Ochreae without a herbaceous limb.

1. Leaves densely white hairy beneath 10. *P. lanigerum*.2. Leaves slightly hairy on the nerves and margins only 11. *P. senegalense*.

317. (1.) **Polygonum Bellardi** All. Flor. Pedem. II (1785), p. 205 tab. 90 fig. 2. — Boiss. Fl. Or. IV, p. 1034. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 135 no. 944. — Annual, 30 to 50 cm high, glabrous, erect, paniculate. Leaves elliptical to lanceolate, 1—4 cm long. Flowers 2—3 in a cluster, with pedicels as long as or longer as the perianth, forming long, slender, interrupted, naked spikes; perianth green with reddish margins; achene minutely dotted, somewhat glossy. — Flow. January to June.

M. ma. Alexandria; Mandara; Abukîr. — **M. p.** Damietta, in sandy places. — **N. d.** Damietta in cultivated ground; Sâlibiya; Tell-el-Kebîr; environs of Cairo very abundantly. — **N. f.** Medînet-el-Fayûm; Senûris; Tomîa. — **N. v.** Siut; Ekhmîm; Dendera; Kene. — **O.** Little Oasis: Gardens in El-Qasr; in rice-fields near Bawiti; Farâfra; Dakhl: Gardens in Tenida; 'Ain Sherif. — Great Oasis: Kharge.

Local name: Maksus-el-gariyia; qardab; qordob.

Also known from South Europe, all the other parts of the Mediterranean region and from India.

318. (2.) **Polygonum aviculare** L. Spec. Plant. I (1753), p. 519. — Boiss. Fl. Or. IV, p. 1036. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 135 no. 945. — Annual, glabrous, much branched from the base. Stems slender, spreading or ascending. Leaves linear-oblong, the lower 2 to 3 cm long, narrowed to a short winged petiole; ochreae white, membranous, bifid, many-nerved. Flowers from the axills of the upper leaves and forming a short dense terminal raceme; bracts ovate white, membranous, not ciliate; pedicels shorter than the bracts. Perianth 2,5 mm long. Nut ovoid-trigonal, not longer than the perianth, minutely rugose, not shining. — Flow. March to April.

N. d. Shubra near Cairo.

A cosmopolitan species.

var. **litorale** (Link.) Boiss. in Flor. Or. IV (1879), p. 1053. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 135 no. 945. — *Polygonum litorale* Link in Schrad. Journ. I, p. 54. — Branches thicker than in the type and leaves more fleshy. — Flow. March.

M. ma. Marmarica (Letourneux) Samar. (Schweinf.).

Also known from Palestine.

319. (3.) **Polygonum plebejum** B. Br. Prodrum (1810), p. 420. — Meissn. in DC. Prodrum. XIV, p. 94. — *Polygonum herniarioides* Del. Flor. Aeg. Illustrat., p. 61. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 135 no. 948. — Boiss. Fl. Or. IV, p. 1038. — Very similar to *Polygonum aviculare*. Stems trailing, with shorter internodes. Leaves linear-oblong, 6 to 12 mm long; ochreae more lacerate, with fewer ribs. Flowers smaller. Nut smaller, ovoid-trigonal, smooth and shining. — Flow. April.

M. ma. Abundantly on alluvial soil: Alexandria-East; Mandara. — **M. p.** Damietta. — **N. d.** Environs of Cairo very abundantly; Merg; Damanhur. — **N. v.** El-Matahare near Minia; Abu-Girge; Gebel Silsile; Beni-Suêf; Ekhnîm; Girge; Thebes. — **O.** Great Oasis.

Local name: Quteyh (Schweinf.).

Also known from the Upper Nile, Lower Guinea and the Mozamb. District.

320. (4.) **Polygonum maritimum** L. Spec. Plant. I (1753), p. 519. — Boiss. Fl. Or. IV, p. 1037. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 135 no. 947. — When flowering the first year of its growth,

or when luxuriant, this species is distinguished from *Polygonum aviculare* by its thicker stems, larger and thicker, more glaucous leaves, larger scarious stipules, brown and much veined at the base, large flowers, and especially by the nuts, often 5 mm long, project in beyond the perianth, and very smooth and shining. Older specimens, grown in drier sands, have a woody, perennial stock, with short, thick branches, completely covered by the stipules, the internodes being all very short. — Flow. March to June.

M. ma. Abusîr.

Also known from the other parts of the Mediterranean region and from Europe.

321. (5.) **Polygonum equisetiforme** Sibth. and Smith Fl. Graec. I (1806), p. 288 tab. 364. — Boiss. Fl. Or. IV, p. 1036. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 153 no. 946. — *Polygonum Ehrenbergii* Meissn. in DC. Prodrum. XIV, p. 86. — Perennial, 50 to 80 cm high, procumbent, slender, simple or densely branched. Leaves oblong to oblong-lanceolate, 5 mm to 3.5 cm long, acute, margin rather wavy, the floral linear, as long as the flowers or a little longer. Flowers 2—3 in a cluster, in long, terminal, loose or dense racemes; pedicels about as long as the perianth or a little longer; achene glossy. — Flow. February to May.

M. ma. M. p. N. d. N. f. N. v. O. D. l. D. i. D. a. sept. D. a. mer. Everywhere in sandy ground and cultivated places abundantly.

Local name: Gurdab; Mitibney; qudab; quzzab.

Europe and everywhere in the Mediterranean region from the Canaries to Persia.

322. (6.) **Polygonum serrulatum** Lag. Gen. et Spec. Nov. (1816), p. 14. — Boiss. Fl. Or. IV, p. 1028. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 134 no. 938. — Sickenberg. Contrib. Fl. d'Eg., p. 273. — Meissn. in DC. Prodrum. XIV, 133. — *Polygonum salicifolium* Del. Ill. Flor. d'Eg., p. 12. — Annual, stem slender, glabrous, 60 to 80 cm high, erect or decumbent at the base. Leaves lanceolate, acuminate, rounded at the base, subsessile, glabrous or slightly hairy the lower 6 to 10 cm long; ochreae ciliate with long bristles. Spikes slender, cylindrical, often several to a stem, 5—8 cm long; peduncle very slender, glabrous; bracts rigidly ciliate. Perianth pink, eglandular. 2.5 cm long. Stamens 6—8. Styles usually 3. Nut usually trigonous, polished shorter than the perianth. — Flow. March.

N. d. In ricefields near Alexandria. — **N. v.** Damietta. — **N. f.** Medinet-el-Fayûm.

Local name: Salfa.

Widely distributed throughout Africa.

323. (7.) **Polygonum persicaria** L. Spec. Plant. I (1753), p. 518. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 134 no. 839. — *Polygonum niloticus* Meissn. in DC. Prodom. XIV, p. 119. — Annual, 30 to 80 cm long; stems erect or ascending, simple or stiff-branched. Ochreae ciliate; leaves oblong-elliptical to lanceolate, sparingly hairy to glabrescent. Spikes peduncled or sessile, oblong-cylindrical, dense rather erect; perianth greenish purple, destitute of glands ochreae ciliate. — Flow. March to April.

M. ma. Alexandria. — **N. d.** Damietta.

Throughout Europe and Central and Russian Asia.

324. (8.) **Polygonum Convolvulus** L. Sec. Plant. I (1753), p. 522. — Boiss. Fl. Or. IV, p. 1032. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 135 no. 943. — Sickenberg. Contrib. Fl. d'Eg., p. 273. — A glabrous annual, with a twining stem as in *Convolvulus*. Stipules short. Leaves stalked, heart-shaped or broadly sagittate, and pointed. Flowers in little loose clusters; the lower ones axillary, the upper ones forming loose, irregular, terminal racemes. Styles 3. Fruiting perianth to 5 mm long; the 3 outer segments closely surrounding the triangular nut and sometimes sharply keeled on the midrib, but rarely winged. — Flow. March.

M. ma. Gabari; Ramle.

Also known from Europe, Central and Russian Asia, North America and the arctic regions.

325. (9.) **Polygonum limbatum** Meissn. in DC. Prodom. XIV (1857), p. 123. — Boiss. Fl. Or. IV, p. 1043. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 134 no. 942. — Sickenberg. Contrib. Fl. d'Eg., p. 273. — Perennial; stem pilose at first, then glabrescent, 60—120 cm long. Leaves lanceolate, nearly sessile, 6 to 10 cm long, clothed on both sides with short appressed hairs; ochreae hairy, large, tightly clasping the stem in their lower two-thirds, with a patent crisped herbaceous limb ciliate with rigid bristles. Racemes about 3 to a branch, dense, 4 to 8 cm long; bracts ciliate with rigid bristles; peduncles clothed with appressed hairs. Perianth pink, 3 mm long. Stamens 7. Styles 2. Nut lenticular, convex glossy, nearly black, shorter than the perianth. — Flow. February to May.

N. d. Menzale; Sherbin; San; Abu Hammas; Tanta; Benera. — **N. f.** Medinet-el-Fayûm.

Also known from Tropical Asia and Africa.

326. (10.) **Polygonum lanigerum** R. Br. Prodom. (1810), p. 419. — Boiss. Fl. Or. IV, p. 1034. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 134 no. 940. — Meissn. in DC. Prodom. XIV, p. 117. — Perennial; stem stout, erect, 80—120 cm high, white-tomentose

upwards. Leaves shortly petioled, lanceolate, acute, clothed densely beneath and thinly above with persistent white tomentum, the lower, 12—18 cm long, 2—5 cm broad at the middle; ochreae long, membranous, ciliate. Racemes dense or moderately dense, oblong or oblong-cylindrical, 2—6 cm long; bracts orbicular, shortly ciliate; peduncles pubescent, eglandular. Perianth eglandular, 2—5 mm long. Stamens usually 6. Styles 2. Nut lenticular, orbicular, black, shining. — Flow. March to April.

N. d. Kafr Hawân near Faqûs. — **O.** Little Oasis; 'Aweyna near El-Qasr.

Widely distributed throughout Africa, Tropical Asia and North Australia.

327. (11.) **Polygonum senegalense** Meissn. in DC. Prodrôm. XIV (1857), p. 54. — Boiss. Fl. Or. IV, p. 1031. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 134 no. 941. — Sickenberg. Contrib. Fl. d'Eg., p. 273. — Perennial. Stems stout, robust, erect, glabrous, 1·2 to 1·5 m high. Leaves distinctly petioled, oblong-lanceolate, glabrous except on the midrib and margins, acute, narrowed very gradually to the base, the lower 12—16 cm long, 2—5 cm broad at the middle; ochreae large, truncate, not ciliate with bristles. Racemes few or several, cylindrical, moderately dense, 4—8 cm long; bracts broadly ovate, not fringed; pedicels 3—4-nate, at last about as long as the bract. Perianth pale pink, 3 cm long. Stamens usually 7. Styles 2. Nut orbicular, with flattened faces, shining, nearly black. — Flow. March to April.

M. ma. Ramle. — **N. d.** Alexandria; Rosetta; Damanhur; Damietta; San; Sâlihiya; Near Malaha.

Local name: habaq.

Also known from Tropical Asia, Madagaskar and Tropical Africa.

Imperfectly known species.

Polygonum tumidum Delile Flor. Aeg. Illustr. (1813), p. 60 and in Mémoir. Plant. Spont. Egypt., p. 12. — Meissn. in DC. Prodrôm. XIV, p. 142.

Centrospermae.

Herbs, sometimes more or less shrubby, occasionally nearly leafless, with green, pale or highly coloured foliage. Leaves alternate or opposite, sometimes reduced to scales. Flowers mostly perfect, sometimes monoecious or dioecious, variously disposed, occasionally much reduced. Calyx usually present the sepals mainly separate. Corolla wanting or present, small or inconspicuous or

relatively large and showy. Androecium of 1—several stamens. Gynoeceum of a single carpel or several united carpels. Ovary 5—many-celled by suppression, 1-celled. Styles mainly distinct. Ovules amphitropous or campylotropous. Fruit an utricle, achene or a berry, sometimes an anthocarp. Embryo curved, annular or coiled.

26. Chenopodiaceae.

Herbs or rarely shrubs, often succulent. Leaves alternate or rarely opposite, sometimes none. Stipules wanting. Flowers in sessile clusters, either in axillary or terminal spikes or panicles, and often unisexual. Bracts inconspicuous, or in a few genera 2 lateral ones to each flower, adhering to the perianth and then often described as an outer two-lobed calyx. Perianth small; segments 5 or in some flowers fewer, herbaceous, imbricate in the bud. Stamens 5, opposite the segments. Ovary free, with a single erect ovule. Styles 2 or 3, either free, or united at the base. Fruit consisting of a tiny seed in a very thin or sometimes succulent pericarp, and enclosed in the persistent calyx, which is sometimes enlarged or altered in form. Seed usually orbicular and flattened. Embryo coiled round a mealy albumen, or spirally twisted with scarcely any albumen.

A large cosmopolitan order, most abundant in maritime or saline stations.

Suborder I: Cyclolobae.

Embryo circular or horseshoe-shaped, surrounding the copious albumen.

A. *Chenopodieae*. — Flowers perfect. Sepals alike. Testa crustaceous. Stems not jointed.

I. Perianth 5-fid or parted, unchanged in fruit, free. Stamens 5

1. *Chenopodium*.

II. Perianth 5-fid, urceolate, base somewhat adherent to the fruit, and at length indurated.

Stamens 5

2. *Beta*.

B. *Atripliciae*. — Flowers monoecious or dioecious, sometimes polygamous, the staminate perianth 4—5-parted, the pistillate 2—3-dentate, or replaced by 2 bracts. Testa crustaceous or coriaceous. Stems not jointed.

I. Leaves glabrous.

a) Female perianth globular, 2—3-dentate, enclosing the ovary

3. *Spinacia*.

b) Female perianth 0, replaced by 2, appressed, foliaceous, more or less connate bracts

4. *Atriplex*.

II. Leaves with stellate hairs

5. *Eurotia*.

C. *Camphorosmeae*. — Flowers perfect or polygamous similar in form. Testa membranous. Stem not jointed.

I. Fruiting teeth not hardened or appendaged

6. *Chenoclea*.

II. Fruiting teeth connivent in a disk, nearly always appendaged

7. *Kochia*.

D. *Salicornieae*. — Flowers perfect, 3—2 together, spiked-catkined, sessile more or less immersed in axillary cups subtended by bracts. Perianth 3—4-toothed or-parted nearly to the base, teeth connivent and continuous, forming a sort of utricule, which at length becomes spongy and has a shield-like apex. Testa membranous. Stems usually jointed. Leaves opposite, enclosing the joints by a sort of sheath, destitute of lamina, and connate in a short, bilobed cup, or scattered, separate, rudimentary or developed.

I. Albumen abundant.

a) Flowers more or less connate, immersed in a floral cup, adnate to it

8. *Halopeplis*.

b) Flowers not connate

9. *Halocnemon*.

II. Albumen 0.

a) Flowers superficially implanted in a floral cup, not connate or scarcely so

10. *Arthrocnemon*.

b) Flowers deeply immersed in a floral cup, adnate to it, connate

11. *Salicornia*.

Suborder II: *Spirolobeae*.

Embryo spiral. Albumen meagre, biparted or 0.

Suaedeae. — Flowers perfect or polygamous, bracteate. Fruit an utricule. Seed horizontal or vertical, the testa usually double, crustaceous and membranous. Embryo flat-spiral. Albumen 0, or forming two lateral masses separate from the embryo. Stems not jointed.

A. Utricle included in the perianth, but free from it

12. *Suaeda*.

II. Utricle adnate to the perianth

13. *Schanginia*.

B. Flowers usually perfect, rarely polygamous, bracteate. Fruit an utricule or rarely a berry. Seed horizontal or vertical, with a single membranous tunic. Embryo conical-spiral. Albumen 0.

I. Seed horizontal.

a) Fruiting perianth not winged

14. *Traganum*.

b) Fruiting perianth winged.

1. *Staminodes* 5. Branches jointed.
 - a) Posterior wing of fruiting perianth spoon-shaped, bent forward over the fruit, the outer spreading 15. *Seidlitzia*.
 - β) Wings of the fruiting perianth all spreading 16. *Haloxylon*.
 2. *Staminodes* 0. Branches not jointed 17. *Salsola*.
- II. Seed vertical.
- a) Outer sepals 3, one posterior and 2 anterior, inner sepals 2, lateral.
 1. Stems not jointed. Lobes of the perianth connate at the base 18. *Noea*.
 2. Stems jointed; lobes of the perianth free at the base 19. *Anabasis*.
 - b) Outer sepals 2, one anterior, the other posterior; inner sepals 3, lateral.
 1. Indument composed of long, jointed bristles, and short hairs.
 - a) Lobes of the fruiting perianth connate at the base 20. *Cornulaca*.
 - β) Lobes of the fruiting perianth free.
 - § Only the two outer lobes of the fruiting perianth winged 21. *Agathophora*.
 - §§ All the lobes of the fruiting perianth winged 22. *Halogeton*.

136. (1.) *Chenopodium* Linn.

Flowers minute, greenish, usually bisexual, sessile in clusters; clusters axillar or in terminal spikes or panicles. Perianth 5-partite, rarely 3—4-partite; segments obtuse, incurved and concave, not at all or very slightly altered in fruit. Stamens 5 or fewer; filaments filiform or flattened, sometimes connate at the base. Ovary depressed or ovoid, styles 2—3, free or united at the base. Fruit an ovoid or depressed membranous utricle, wholly or partially included in the persistent perianth. Seed horizontal or vertical; testa crustaceous; embryo annular, enclosing the copious mealy albumen. — Annual or perennial, erect or prostrate herbs, rarely woody at the base, mealy or glandular-pubescent, seldom glabrous. Leaves alternate, entire or lobed or toothed.

A widely distributed genus of from 50 to 60 species, most abundantly in temperate climates. Of those described below a few are common in many parts of the world as weeds of cultivation or wayside plants, and may not be true natives of Egypt.

- A. Ultimate branches of the inflorescence straight, often 2—5 cm long, with the flower-clusters sessile on them, without stalked glands. Embryo forming one complete circle round the albumen.

I. Styles 2.

- a) Leaves subentire, or lobed, or remotely toothed.

1. Plants foetid 1. *C. vulvaria*.

2. Plants not foetid.

- α) Leaves not or obscurely lobed.

* Leaves ovate, base obscurely triangular 2. *C. album*.

** Leaves subquadrate, base very obtuse 3. *C. opulifolium*.

β) The lower leaves 3-lobed and dentate, the upper entire 4. *C. ficifolium*.

- b) Leaves with many teeth, sometimes 2-serrate 5. *C. murale*.

II. Styles 3. Leaves oblong 6. *C. ambrosioides*.

- B. Ultimate branches of the inflorescence short, dichotomous, slender divaricate and often zigzag, papillose or glandular. Perianth-segments with stalked glands and no meal, embryo forming about $\frac{2}{3}$ of a circle round the albumen . . . 7. *C. Botrys*.

327a. (1.) **Chenopodium vulvaria** L. Spec. Plant. I (1753), p. 220. — Annual, 30 to 60 cm high, foetid, mealy, ash-coloured; stems ascending, much branched. Leaves alternate, petioled, rhombic-ovate, 1—2 cm long, entire. Flower-clusters raceme-like, axillary and terminal, leafless; sepals keelless, covering the fruit; seed dotted, with acutish margin. — Flow. March to June.

M. p. El-'Arish (Ascherson).

A cosmopolitan weed.

328. (2.) **Chenopodium album** L. Spec. Plant. I (1753), p. 219, and ed. II, p. 319. — Boiss. Fl. Or. IV, p. 901. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 125 no. 868. — Suberect, 30 to 90 cm high. Leaves more or less mealy; blade often 2—4 cm long and 1—1.5 cm broad, ovate or elliptic, subentire, obscurely lobed, or remotely toothed, petioles often most shorter than the blades. Panicles axillary, running into a large, terminal nearly leafless inflorescence; ultimate branches nearly straight linear not papillose-scabrid. Perianth-segments ovate-triangular, mealy, thickened (hardly keeled) on the back, tips in fruit folded over the horizontal seed. Ovary glandular

in the upper part; styles 2. Nut dark brown, minutely puberulous, flat; the embryo forming nearly a circle round the albumen. — Flow. March.

M. ma. Umm Katam; Alexandria-West and Alexandria-East; Mandara; Abukîr. — **N. d.** Cairo in fields and on waysides everywhere abundantly. — **N. v.** Everywhere in fields as a weed.

Local name: Fiss-el-ketâb (Del.).

A cosmopolitan weed.

329. (3.) **Chenopodium opulifolium** Schrader in DC. Flor. Franc. (1805), p. 372. — Boiss. Fl. Or. IV, p. 901. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 125 no. 868. — Sickenberg. Contrib. Fl. d'Eg., p. 269. — Leaves mealy; blade often 1—2 cm long, $\frac{1}{2}$ — $\frac{1}{3}$ cm broad, ovate or elliptic, subquadrate, entire or with few irregular lobes, mostly very obtuse at the base; otherwise as *Chenopodium album* L. — Flow. March.

N. d. Damanhur; Tanta; Zifta-Zaqaziq; environs of Cairo, not rare. — **N. v.** Siut; Ekhnîm; Luksor; Aswân.

Local name: mitteyn.

Also known from Europe, the Orient, and Arabia.

330. (4.) **Chenopodium ficifolium** Sm. Flor. Brit. I (1800), p. 276. — Boiss. Fl. Or. IV, p. 901. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 125 no. 867. — Annual, mealy or glaucous, stems erect, striate-ramose. Leaves alternate, long-petiolate, cuneate at the base, oblong or oblong-linear, trilobate-hastate, dentate. Flower-clusters in axillary racemes, forming a narrow, stiff, leafy panicle; perianth-segments acutely carinate appressed to the fruit; seed glossy, finely dotted, with obtuse margins.

M. ma. Alexandria. — **N. v.** Siut, only one specimen (collect. Muschler 1906).

Also known from Europe.

331. (5.) **Chenopodium murale** L. Spec. Plant. I (1753), p. 219. — Boiss. Fl. Or. IV, p. 901. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 125 no. 870. — Sickenberg. Contrib. Fl. d'Eg., p. 269. — Spreading, branching. Leaves more or less mealy; blade 2—8 cm long, ovate-oblong or ovate, acute, serrate with many teeth, not rarely doubly serrate; inflorescence largely axillary, the terminal leafless panicle much shorter than in *Chenopodium album*; perianth-segments ovate-triangular, mealy, thickened (hardly keeled) on the back, tips in fruit folded over the horizontal seed. Ovary glandular in the upper part; styles 2. Nut dark brown, minutely puberulous, flat; the

embryo forming nearly a circle round the albumen. — Flow. March to April.

M. ma. M. p. N. d. N. f. N. v. O. D. l. D. a. sept. D. a. mer.
Everywhere as a weed.

Local name: Fiss-el-kelab; athena; Sekran; Lorbeyh; suntâr; fisseyh; mitteyn (Schweinfurth); mintine; Shegeret-el-mutene.

A cosmopolitan weed.

332. (6.) **Chenopodium ambrosioides** L. Spec. Plant. I (1753), p. 219. and ed. II, p. 320. — Boiss. Fl. Or. IV, p. 904. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 126 no. 872. — Suberect, 40 to 50 cm high, nearly glabrous. Leaves short-petioled, 2,5 to 6 cm long, oblong, narrowed at either end, sinuate-toothed or nearly entire, gland-punctate beneath. Inflorescence running into a copious terminal panicle; ultimate branches straight, often 2,5 to 4 cm long, hairy under 5 cm glass, nearly leafless or with numerous oblong leaves, 0,75 to 1 cm long. Perianth very small, glabrous or obscurely verrucose (neither mealy nor hairy). Ovary in the upper part scabrid or with large glands; style-branches 3, short, or 2 with a smaller branch. Nut horizontal, with the 5 lobes of the perianth folded over it or not rarely vertical. Embryo in the seed almost completely surrounding the albumen. — Flow. February to March.

N. d. Often on way-sides and as a weed in the fields. — **N. v.** On way-sides.

Local name: natne.

A widely spread weed, except in cold countries origin of America.

333. (7.) **Chenopodium Botrys** L. Spec. Plant. I (1753) p. 219. — Boiss. Fl. Or. IV, p. 903. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 126 no. 871. — Stem erect, 30 to 60 cm high, pubescent in the upper part. Leaves of the middle stem: blade 2 to 7 cm long, broadly elliptic, pinnatifid about half-way to the midrib, pubescent on the midrib beneath; petiole 0,8 to 2,5 cm long. Inflorescence copious, dense, forming oblong leafless panicles, often 20 cm long and 4 to 6 cm broad; ultimately branches short, slender, minutely papillose and glandular, divaricate and zigzag. Perianth-segments elliptic-triangular, with stalked glands on the back, without meal or hairs, suberect on the ripe fruit. Ovary without glands; style branches 2. Embryo forming $\frac{2}{3}$ of a circle round the albumen. — Flow. March to April.

N. d. Cairo (Gaillardot).

A widely spread common weed.

137. (2.) **Beta** Linn.

Flowers perfect, greenishwhite, in sessile axillary clusters, these forming spikes disposed in a leafy panicle. Sepals 5; sometimes costate dorsally. Stamens 5, opposite the sepals, perigynous; filaments frequently connate at the base. Ovary sunk in the succulent base of the perianth and partly inferior; styles 2 or 3, short, stigmatose on the inside. Fruit included in the at length much indurated calyx. Embryo annular. — Robust glabrous biennials with large fleshy roots and alternate leaves, the radical large and long petioled, the floral reduced and sessile.

The species are very few, extending along the coasts of Europe, western Asia, and Africa.

334. **Beta vulgaris** L. Spec. Plant. I (1753), p. 322. — var. **foliosa** (Ehrenberg) Ascherson and Schweinfurth in Ill. Fl. d'Eg. (1887), p. 125 no. 866. — Sickenberg. Contrib. Fl. d'Eg., p. 269. — *Beta vulgaris* var. *typica* Boiss. Fl. Or. IV, p. 898. — Annual or biennial, 30 to 50 cm high; stems 1, simple or paniced. Root-leaves ovate, obtuse, cuneate, sometimes subcordate; cauline rhombic-ovate to lanceolate and linear. Flowers 2—3 in a cluster or solitary, arranged in long, slender, leafy or leafless, interrupted spikes; calyx herbaceous, lobes oblong, hooded, in fruit keeled, and thickened at the base into a tubercle; stigmas 2, ovate. — Flow. February to March.

M. ma. Abusîr; Alexandria-West and Alexandria-East. — **N. d.** Damanhur; Tanta; Zaqaqiz; Qalyub; Rosetta; Damietta; Zifta; Cairo. — **N. f.** Medinet-el-Fayûm; Senhûr; Senûris; Tamia; Kafr Mukfut; Gharag. — **O.** Siwa; Little Oasis; Farâfra; Dakhel; Great Oasis. — **D. a. sept.** Wady Dugla.

Also known from Palestine and Syria.

var. **maritima** (L.) Boiss. Flor. Or. IV (1879), p. 899. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 125 no. 866. — Sickenberg. Contrib. Fl. d'Eg., p. 269. — Stems numerous, procumbent. Stigmas ovate-lanceolate. — Flow. March.

M. ma. Matruqa; Mariut; Mandara; Abukîr. — **D. i.** Bîr Abû-Bellah. — **D. a. sept.** Gebel ahmar; Suez: 'Ayûn-Mûsa. — **N. v.** Beni-Hassan; Siut; Esne; Aswân.

Local name: Libdân; Dirs-el-Kelb (Delile); Seyl; Figle; generally: Silq.

Also known from Palestine and Syria.

138. (3.) **Spinacia** Linn.

Flowers dioecious, bractless. Male flowers: perianth 4—5-parted, herbaceous, lobes not appendaged. Stamens 4—5, inserted at the bottom of the perianth, filaments capillary. Female flowers: perianth globular, 2—3-dentate at the tip, including the ovary, in fruit coriaceous, sometimes unarmed, unappendaged, at others furnished with 2—3 prickles, springing from the tube, and growing. Stigmas 4, long, filiform, connate at the base. Nutlet adherent to the perianth, compressed. Seed vertical, with a thin testa. Embryo peripheral, surrounding the farinaceous albumen. — Annual herbs, with the male flowers in terminal, leafless spikes, the female clustered in the axills.

A small genus of only two species in the Orient.

335. **Spinacia glabra** Mill. in Garden. Diction. ed. VIII (1768), p. 2. — Boiss. Fl. Or. IV, p. 904. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 126 no. 873. — 30 to 50 cm high, glabrous, branching from the neck into erect or ascending stems. Root- and lower stem-leaves of the male plants oblong to oblanceolate in outline, pinnatisect into oblong to linear-lanceolate lobes, the upper stem-leaves linear-lanceolate to linear, dentate or entire. Root- and lower stem-leaves of the female plants oblong, pinnatilobed into triangular, obtuse or acutish lobes, upper stem-leaves oblong to oblong-ovate, half-clasping at the base, obtusely lobed or entire. Male spikes interrupted, leafless, simple or thyrsoid-panicled; female spikes simple, leafy, floral leaves much longer than the flowers; lobes of the fruiting perianth connate, with two broad, triangular, horizontal, spiny horns. — Flow. March to April.

M. ma. Alexandria-West, subspontaneous.

Local name: sibânakh; es-bânakh.

Also known from Palestine.

139. (4.) **Atriplex** Tournef.

Flowers unisexual, usually in clusters arranged in simple or panicled spikes, the sexes distinct or mixed in the clusters. Male flowers ebracteate. Perianth 3—5-partite; segments oblong or ovate, obtuse. Stamens 3—5. Female flowers 2-bracteate; bracts small at first, erect and appressed, distinct or more or less connate, enlarged in fruit and forming a variously shaped 2-valved covering to the utricle. Perianth wanting or very rarely of 2—5 hyaline segments. Ovary small; styles 2, filiform. Utricle entirely concealed within the base of the greatly and enlarged and thickened bracts:

pericarp thin, membranous. Seed compressed, vertical or very rarely horizontal; testa thin, crustaceous or coriaceous; embryo annular, surrounding the copious mealy albumen. — Herbs or shrubs, usually more or less mealy or scurfy-tomentose. Leaves alternate or sometimes the lower ones opposite or all so.

A large genus of about 120 species, widely spread through most parts of the globe, but chiefly along sea-coasts or in saline localities.

A. Annuals.

I. Bracts parted to the base.

- a) Leaves triangular, not beset with cristalline papillae 1. *A. hastatum*.
- b) Leaves ovate, beset with cristalline papillae 2. *A. dimorphostegium*.

II. Bracts parted only to or above the middle 3. *A. tataricum*.

B. Perennials or shrubs.

I. Leaves opposite 4. *A. portulacoides*.

II. Leaves alternate.

a) Leaves all sessile.

- 1. Leaves elliptical oblong and oblong linear 5. *A. parvifolium*.
- 2. Leaves round 6. *A. Ehrenbergii*.

b) Lower leaves short petioled, the rest sessile 7. *A. leucocladum*.

c) Leaves all short petioled.

- 1. Entire or obsoletely repand at the base.
 - α) Plant silvery white 8. *A. Halimus*.
 - β) Plants mealy canescent 9. *A. coriaceum*.

2. Cordate with a narrow sinus and small obtuse auricles at the base 10. *A. farinosum*.

336. (1.) ***Atriplex hastatum*** L. Spec. Plant. I (1753), p. 1494. — Boiss. Fl. Or. IV, p. 909. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 126 no. 874. — Sickenberg. Contrib. Fl. d'Eg., p. 269. — Moquin in DC. Prodom. XIII, p. 94. — 30 cm to 1 m high; stems herbaceous erect, 30 cm long. Lower leaves opposite, upper ones alternate, petioled; blade 4—7 cm long, ovate, acute, toothed, hastate at the base, sparingly mealy or glabrate. Spikes running into terminal panicles, sometimes dense; bracteoles 2 mm long, deltoid-triangular, united only at the base, smooth or sparsely tuberculate on the back, toothed at the margin. Fruit erect, flattened between the two bracteoles; pericarp thin. — Flow. March to April.

N. d. Alexandria; Gabari, in fields; Rosetta, in moist saline soil; in ditches; Damanhur near the canal; Talkha, near Mansura; Mouth of the Nile near San.

Local name: Motmna.

var. **salinum** Wallr. in ex Boiss. Fl. Or. IV (1879), p. 909. — More or less scurfy; leaves narrower hastate but entire. — Flow. March to April.

M. ma. Ramle. — **M. p.** Rosetta, in moist saline soil.

The type is abundant in Europe; found in nearly all temperate and warmtemperate climates.

337. (2.) **Atriplex dimorphostegium** Karel and Kir. Enumer. Song. (1841), p. 714. — Boiss. Fl. Or. IV, p. 909. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 126 no. 875. — Sickenberg. Contrib. Fl. d'Eg., p. 269. — Moquin in DC. Prodom. XIII, p. 100. — 20 to 30 cm high, branching from the neck, prostrate or ascending. Leaves alternate, beset with crystalline papillae, especially at the under surface, grey, petioled, truncate at the base or short cuneate, ovate, obtuse, entire. Some of the flowers arranged 2—3 in a cluster in the lower axills, with fruiting bracts 6 mm long, stipitate, reflexed, membranous, cordate-orbicular, smooth at the back, repand denticulate at the margin, the others in short, terminal spikes, the fruiting bracts much smaller, triangular-ovate, crested at the back. — Flow. March to June.

D. i. Under the *Tamarix articulata* in the Wady-el-'Arish; Desert-el-Tih. — **D. a. sept.** Wady Dugla near Cairo; Helwan.

Local name: Zurbah.

Also known from the other parts of the Mediterranean region.

338. (3.) **Atriplex tataricum** L. Spec. Plant. I (1753), p. 1053. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 126 no. 876. — Sickenberg. Contrib. Fl. d'Eg., p. 269. — 50 cm to 1 m high, at length indurated, usually scurfy-white; stems erect or diffuse, much branched. Leaves short petioled, alternate or the lowermost opposite, hastate-deltoid, dentate, incised, lobed, or rarely entire, the upper lanceolate to lanceolate-linear. Flower-clusters crowded in naked, usually more or less interrupted spikes; bracts rhomboid or somewhat 3-lobed, dentate or entire, more or less tubercled at the back. — Flow. February to March.

N. f. Medinet-el-Fayûm.

Local name: Qataf.

Also known from South and Eastern Europe.

339. (4.) **Atriplex portulaccoides** L. Spec. Plant. I (1753). p. 1493. — Boiss. Fl. Or. IV, p. 913. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 126 no. 877. — Obione portulacoides Moquin in DC. Prodrum. XIII, p. 112. — Perennial undershrub, 50 cm to 1 m high, silvery-scurfy; stems procumbent at the base, than ascending. Leaves short-petioled, tapering at the base, oblong to lanceolate-linear, 2—6 cm long. Flower-clusters loosely spiked forming small, terminal, leafless panicles; bracts canescent, long cuneate at the base, somewhat stalked, 3-toothed at the tip, the teeth short, triangular, about equal, or the intermediate one smaller, mucroniform. — Flow. August to September.

M. ma. Râs-el-Kenâ'is; Abusîr; Alexandria-West; Alexandria-East; Mandara; Abukîr. — **M. p.** Rosetta, in moist saline soil; Damietta; Port Said. — **N. d.** Miniyet-Murshîd.

Local name: Quataf.

Also known from South Europe, and from the other parts of the Mediterranean region from the Canaries to Persia.

340. (5.) **Atriplex parvifolium** Lowe Primit. et Novit. faun. et flor. Mader. (1851), p. 16. — *Atriplex palestina* Boiss. Diagnos. Plant. Or. ser. I, fasc. XII, p. 96. — *Atriplex alexandrium* Boiss. Fl. Or. IV, p. 914. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 126 no. 878. — Perennial, 20 to 40 cm high, papillose-mealy, canescent; stems numerous ascending, terete, leafy. Leaves elliptical to oblong and oblong-linear, 2—4 cm long, sessile, tapering at the base, entire or obtusely sinuate-repand, the uppermost linear-acute. Flowers densely fascicled in axills, the two kinds together forming terminal, interrupted spikes or panicles, and fertile flowers alone in the lower axills; bracts 2 mm long, oblong-rhombic, cuneate at the base, entire, 3—4-tubercled. — Flow. March to April.

M. ma. Matruqa; Alexandria-West; Mandara; Abukîr. — **M. p.** Rosetta, in sandy places; Damietta, in saline soil. — **N. d.** Damanhur; Tanta; Mehallet-el-Kebîr; Zifta; Benha-el-'asl; Qalyûb; Environs of Cairo. — **D. i.** Wady-el-'Arîsh.

Throughout Northern Africa from the Canaries to Palestine.

341. (6.) **Atriplex Ehrenbergii** F. v. Muell. in litt. ad Schweinf. — *Atriplex crystallinum* Ehrenberg ex Boiss. Fl. Or. IV, p. 915. — not Moq. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 126 no. 879. — Sickenberg. Contrib. Fl. d'Eg., p. 269. — Perennial, 20 to 25 cm long, stems diffuse or ascending. Leaves round, 4 to 6 mm in diameter, entire, the axills bearing leaf-clusters. Flower-clusters crowded in slender, terminal, interrupted, simple or branched spikes;

fruiting bracts 3 mm long, ovate-rhombic somewhat 3-lobed, the terminal lobe much longer, ovate the dorsum crested-tubercled. — Flow. March to June.

M. ma. Alexandria.

Only known from this locality.

342. (7.) **Atriplex leucocladum** Boiss. Fl. Or. IV (1879), p. 915. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 126 no. 880. — 30 cm to 1 m high, silvery-white; stems numerous, ascending, white, diffusely branched. Leaves short cuneate to truncate at the base, deltoid-ovate to oblong, 1—3 cm long, obtuse, entire or sinuate-dentate, the lower short petioled, the rest sessile, the uppermost minute. Flower-clusters in loose, simple or paniced, short almost leafless spikes; fruiting bracts 5 mm long and broad, united to the middle, round-cuneate at the base, 3-lobed, with unarmed disk; lobes rounded, obtuse, the intermediate somewhat larger. — Flow. Dezember to March.

M. ma. Alexandria-West. — **O.** Farāfra; Dakhel; Great Oasis. — **D. a. sept.** Moqqattam; Gebel ahmar; Abassiya; Galala; Wady Azhar; Wady Abusateri; Wady Abu-Retama; Wady Hamashiya; Quarries in the east of Gaïet-Bey; Mouth of the Wady Qene; near Thebes.

Local name: shegeret-el-bayyadin; generally; rught; roghl; burghl.

Also known from Palestine and Syria.

343. (8.) **Atriplex Halimus** L. Spec. Plant. I (1753), p. 1052 and ed. II, p. 1492. — Boiss. Fl. Or. IV, p. 916. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 126 no. 882. — An erect shrub, 30 cm to 1,20 m high. Leaves alternate, petioled; blade 2,5 cm long, oblong, narrowed at the base, with very close short whitish tomentum underneath. Branches mostly of one sex; inflorescences axillary, but especially in the males into terminal panicles, leafless at the top. Male perianth with close tomentum. Fruiting bracts 2—4 mm long and broad, triangular or ovate, smooth on the back, entire, sinuate or somewhat toothed on the margin united only at the base. Fruit flattened, erect, between the two bracteoles. — Flow. January to March.

M. ma. Matruqa; Abusîr; Mariut; Lasr-el-Ajdeliya; Alexandria-West and Alexandria-East; Mandara; Abukir. — **M. p.** Resetta.

Also known from Europe and the Mediterranean region.

var. **Schweinfurthii** Boiss. Fl. Or. IV (1879), p. 916. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 126 no. 882. — Sickenberg. Contrib. Fl.

d'Eg., p. 269. — Leaves membranous, longer petioled than in the type, abruptly and shortly cuneate, often subcordate. — Flow. March.

D. i. Borders of the lake Timsa; Qassatin; Sâlihîya; El-Qantara. — **D. a. sept.** Helwan, Wady Liblab; Wady warag; Wady Dugla near Cairo; saline localities near Bir Abu Dellah; forming great shrubs in the Wady Khafûra; Wady Gaffara near Dar-el-Beda; Suez. — **D. a. mer.** Wady Hanamîya.

Local name: roghat (Forsk.); generally; qataf.

The variety is only known from Egypt.

344. (9.) **Atriplex coriaceum** Forsk. Flor. Aeg.-arab. (1775), p. 75. — Boiss. Fl. Or. IV. p. 915. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 126 no. 881. — *Atriplex ocymifolium* Viv. Plant. Aeg., p. 23. — Sickenberg. Contrib. Fl. d'Eg., p. 269. — Fruticous, densely canescent, stems decumbent, woody at the base; branches ascendent, leafy. Leaves alternate, shortly petioled, entire at the base, ovate or oblong. Flower-clusters densely spiked, arranged in a terminal much branched panicle; fruiting bracts small, sessile, spatulate, entire, spongy, connate to their middle, rounded at the tip. — Flow. February to April.

M. ma. Marmarica: Alexandria-East; Mandara, in deep sand; Alexandria-West on calcareous ground.

Local name: retem (Forsk.).

Only known from the Mediterranean shores of Egypt.

345. (10.) **Atriplex farinosum** Forsk. Flor. Aeg.-Arab. (1775), p. CCXXIII no. 302. — Boiss. Fl. Or. IV. p. 917. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 126 no. 883. — Sickenberg. Contrib. Fl. d'Eg., p. 269. — An undershrub, 90 cm high, not mealy; leaves alternate, blade 4 cm long, 2—3 mm broad, in the middle stem-leaves cordate or auricled (sometimes with acute auricles), margin entire or sparingly toothed, undersurface with dense minute white tomentum; petioles wanting or 1—2 mm long. Two bracteoles in fruit orbicular, 2.5 mm in diameter, flattened, densely tomentose, without tubercles in the few examples seen.

D. a. sept. Suez: Wady Go'eybe. — **R.** Mirsa Wady Lekhuma; on the sea-shores; Qoseyr, Ras Benass; Safag. Characteristic shrub of the Red Sea Coast. — Flow. April.

Local name: Howai (Schweinf.).

Also known from the coast region of Nubia and British East Africa, and from Arabia.

140. (5.) **Eurotia.**

Flowers dioecious or monoecious. Male flowers without bracts: calyx 4-parted, stamens as many as sepals, with slender exserted filaments. Female flowers bibracteate, without perianth. Bracts sessile, obcompressed, united, becoming enlarged and membranous, densely hairy, not winged or appendaged. Styles 2, somewhat hairy exserted. Fruit oblong-ovate, sessile, the pericarp membranous and rather firm, pubescent. Seed vertical, ovate with simple membranous testa. Cotyledons broad and green; radicle inferior. — Low stellately undershrubs; stems tomentose; leaves alternate, entire; flowers in small axillary and somewhat apicate clusters.

A small genus of only three species in America, Asia and Southern Europe.

346. **Eurotia ceratoides** (L.) A. Mey. Boiss. Flor. Or. IV, p. 917. — Suffrutescent, whitetomentose throughout, branched from the base, woody below, with strict ascending leafy branches; leaves subcoriaceous, linear-oblong or lanceolate, obtuse, at the tip subrevolute, shortly petioled. Calyx lobes ovate, acute, hairy; fruiting bracts lanceolate, 4 to 6 mm long, nearly covered by 4 dense spreading tufts of long white hairs, and beaked above with two short erect horns; utricle filling the cavity and loosely enveloping the seed, which is 2—3 mm long. — Flow. March.

D. a. sept. Wady-el-abiad, in the northern Galala (Schweinfurth).

Local name: gheyl.

Also known from Austria, Southern Europe and the other parts of the Mediterranean region.

141. (6.) **Chenoclea** Linn.

Flowers bisexual, or by abortion polygamous, bractless. Perigonium urn-shaped, with 5, short, fleshy, somewhat keeled, wooly lobes, not becoming indurated or appendaged. Stamens 5, inserted at the bottom of the perianth, anthers exserted. Ovary ovate. Style divided into 2, filiform lobes. Utricle depressed, included in the unchanged but closed perianth, pericarp membranous. Seed horizontal, testa membranous. Embryo peripheral, albumen little or wanting. — Low fleecy canescent shrubs.

A small genus of only 3 species in Africa and Western Asia.

347. **Chenoclea arabica** Boiss. Diagnos. Plant. Or. ser. 1. XII (1853), p. 97. — Flor. Or. IV, p. 922. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 126 no. 884. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 665 no. 274. — Sickenberg. Contrib. Fl. d'Eg., p. 268. — Perennial,

10 to 30 cm high; flowering branches ascending, fleecy, ending in spikes interrupted at the base. Leaves sessile oblong-linear, 5—10 mm long, 1.5 mm broad, obtuse. Flowers 5—15 in ovate or globular, sessile clusters, spikes leafy, 3—10 cm long; floral leaves ovate-oblong to oblong, glabrescent, about as long as the flowers; lobes of the perianth cocoony, hemispherical. — Flow. March to April.

M. ma. Matruqa; Old quarries near Behig. — **D. a. sept.** In the Southern Galâla, not rare.

Local name: thal athe; thel athe.

Also known from Palestine and Syria.

142. (7.) **Kochia** Roth.

Flowers very small, bisexual or female. Perianth ovoid-cylindric, with 5 lobes; lobes persistent, incurved over the fruit, a scale or horizontal crest developed in fruit spreading from the base of each lobe. Stamens 5. Ovary sessile, ovoid; styles 2, or sometimes 3; ovule 1, on a short basal stalk. Utricle membranous; seed horizontal; embryo annular, surrounding the often scanty albumen. — Small herbs or shrubs; stems not transversely marked nor as though jointed. Leaves alternate, small; blade linear-oblong or cylindric, not acute prickly. Flowers in clusters of 2—3 solitary, axillary and running into terminal leafless panicles.

A genus of about 30 species; many in Australia; a few scattered throughout the Old world.

- A. 90 to 150 cm high; glabrous or pubescent; spines of the fruiting perianth shorter than the diameter of the disk 1. **K. scoparia**.
- B. 30 to 50 cm high; densely villous; spines of the fruiting perianth twice to thrice as long as the disk 2. **K. muricata**.
- C. 20 to 40 cm high; lanate; spines of the fruiting perianth as long as the disk 3. **K. latifolia**.

348. (1.) **Kochia scoparia** Schrad. Neue Journ. (1809), p. 85. — Boiss. Flor. Or. IV, p. 925. — Moq. in DC. Prodr. XIII, p. 130. — *Chenopodium scoparia* L. Spec. Plant. I, p. 321. — A tall herb, 80 to 100 cm long, glabrous or pubescent, strict, erect; leaves green, lanceolate or linear-lanceolate, small, acute, midrib distinct. Clusters in leafy paniced spikes; wings of the fruiting perianth short, semicircular, scarious nerved entire shorter than the diameter of the disk. — Flow. March to June.

N. d. Cairo, el-khaliq, spontaneous; introduced by the Howling Dervishes for making brooms.

North and Central Asia to Japan and westward to Spain.

349. (2.) **Kochia muricata** (L.) Schrad. Journ. (1809), p. 86. — *Salsola muricata* L. Mast., p. 54. — *Bassia muricata* All. misc. Taur. Ill. p. 6. — *Cornulaca muricata* Del. Ill. Flor. d'Eg., p. 55. — *Echinopsilon muricatus* Moq. in DC. Prodrum. XIII, p. 134. — *Salsola monobractea* Forsk. Flor. aeg.-arab., p. 55. — Boiss. Fl. Or. IV, p. 926. — Annual, 30 to 50 cm high, densely villous, usually many stemmed from the neck; stems erect or ascending, paniced. Leaves linear-lanceolate, 5 to 15 mm long, somewhat fleshy flat. Flowers 1—3 in a cluster, sessile, subtended by deciduous, oblong leaves as long as the clusters or longer; spikes loose; spines of the fruiting perianth needle-shaped, yellow, spreading, straight, twice to thrice as long as the disk. — Flow. March.

M. ma. Alexandria-West, not rare. — **M. p.** Rosetta; Damietta. — **D. i.** Pyramids of Giza and Saqqâra. — **D. i.** Suez; Serapeum; Ismailia. — **D. a. sept.** Wady Dugla. — **D. a. mer.** Qoseyr.

Local name: 'Areyim (Forsk.); Haithâm; Ghobeyrâ (Ascherson). Also known from other parts of North Africa and from Asia.

var. **tenuifolia** Boiss. Flor. Or. IV (1879), p. 927. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 127. — *Kochia ericifolia* Viv. Plant. aeg., p. 25. — Stems and branches smaller, leaves smaller. — Flow. March.

M. ma. D. i. D. a. sept. D. a. mer. Sands and fields in and near deserts.

Also known from Tropical Arabia.

350. (3.) **Kochia latifolia** Fresen. Beitr. (1837—45), p. 179. — Boiss. Fl. Or. IV, p. 927. — *Bassia latifolia* Aschers.-Schweinf. Ill. Fl. d'Eg., p. 127 no. 886. — *Echinopsilon eriophorum* Moq. in DC. Prodrum. XIII, p. 135. — Annual, 20 to 30 cm high; branching from the neck; branches brittle, fleecy. Leaves oblong-linear, obtuse, 1 cm long sparingly hirsute, the floral oblong-linear to elliptical. Flower-cluster densely spiked, almost hidden by dense, long fleece; spines of the fruiting perianth subulate, as long as the disk, with incurved tip. — Flow. April.

D. a. sept. Wady Dugla.

Also known from Palestine.

var. **inermis** Boiss. Flor. Or. IV (1879), p. 927. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 127 no. 886. — *Loudesia ciantha* Fisch. and Mey. Ind. II. Petrop., p. 40. — Some of the upper flowers perfect with a vertical seed, the others perfect or female, sterile or with a horizontal seed. Fruiting perianth not appendaged. — Flow. March.

D. a. sept. Wady Azhar; W. Ommkuthy (Schweinfurth).

Also known from Palestine and Sinai.

143. (8.) **Halopeplis** Bunge.

Flowers very small, bisexual. Perianth obconic, with 3 teeth. Stamens 1 or 2. Ovary ovoid, superior; style short, with 2 short linear branches; ovule 1, suspended on a basal funicle. Seed erect, orbicular, compressed; embryo peripheric round the albumen. — Annuals or shrubs, glabrous or nearly so; branches not jointed. Leaves 2—3 mm long, ovate or orbicular, amplexicaul and appearing perfoliate in the North African species. Bracts in small spikes, with usually 3 flowers under each.

A small genus of only 3 species in the Mediterranean region, Arabia and Persia.

A. An annual herb, 10 to 30 cm high 1. **H. amplexicaulis**.

B. A woody branched glabrous shrub, 40 to

60 cm high 2. **H. perfoliata**.

351. (1.) **Halopeplis amplexicaulis** (Vahl) Unger ex Cesati. Passer and Gibelli Comp. Fl. Ital. (1869—1870), p. 271. — Boiss. Flor. Or. IV, p. 934. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 127 no. 890. — Sickenberg. Contrib. Fl. d'Eg., p. 292. — *Salicornia nodulosa* Del. Descr. Eg., p. 121. — *Salicornia strobiliacea* Del. Ill. Flor. d'Eg., tab. 3 fig. 2. — *Halostachys perfoliata* Moq. in DC. Prodrum. XIII. p. 148. — Annual, 10 to 30 cm high, glaucous; stem at length often indurated below, branching from the base; branches horizontal and ascending, nodular. Leaves minute, alternate, half-globular, clasping obtuse, with rudimentary lamina. Spikes sessile, alternate, oblong, 5 to 15 mm long, racemed; flowers connate to the tip; stamens 1. — Flow. March to April.

M. ma. Alexandria-West. — **M. p.** Rosetta; Damietta. — **N. d.** Between Matariya and Menzale in rice-fields. — **O.** Little Oasis.

Local name: 'Adu (Ehrenberg).

Also known from the other parts of the Mediterranean region.

352. (2.) **Halopeplis perfoliata** (Forsk.) Bunge ex Boiss. Fl. Or. IV, p. 935. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 127 no. 891. — *Salicornia perfoliata* Forsk. Flor. aeg.-arab., p. 3 tab. 1. — *Halostachys perfoliata* Moq. in DC. Prodrum. XIII, p. 148. — A woody branched glabrous shrub, 30 to 60 cm high; branches with closely placed nodes, not jointed. Leaves 2 to 2.5 mm long, ovate or orbicular, sessile and minutely decurrent at the base. Spikes of flowers small, dense; floral bracts similar to the leaves, with usually 3 flowers under each bract, more or less adnate thereto. — Flow. February to March.

R. Gulf of Berenice (Schweinfurth).

Also known from Nubia.

144. (9.) **Halocnemon** M. Bieb.

Flowers very small, bisexual. Perianth of 3 unequal obovate segments, united below. Stamen 1. Ovary ovoid, narrowed upwards; style short, branches 2, sometimes 3; ovule 1, suspended on a basal funicle. Seed vertical; embryo peripheric round the albumen. — A small shrub; stem continuous, the branchlets and spikes apparently articulated. Leaves 0. Bracts in small spikes, with usually 3 flowers under each.

Species 1, also in Europe, the other parts of the Mediterranean region, the Orient and Central Asia.

353. **Halocnemon strobiliaceum** M. Bieb. Flor. Taur. Cauc. III (1819), p. 3. — Boiss. Fl. Or. IV, p. 936. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 127 no. 892. — Sickenberg. Contrib. Fl. d'Eg., p. 270. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 666 no. 278. — *Salicornia strobiliacea* Pallas Voy. I, p. 744 Tab. 23, fig. 1. — Perennial, 30 cm or more high, much branched; branches and branchlets ascending, with short, club-shaped or cylindrical joints, the top of each of which ends in an obtuse cupule of leaves, enclosing globular, sterile buds. Spikes oblong to cylindrical, sessile, lateral and terminal; lamina of bracts semicircular; stamen 1. — Flow. March to April.

M. ma. Abusir; Mariut; Alexandria-West and Alexandria-East; Abukir. — **M. p.** Rosetta; Damietta; Hawah Port Said; El-'Arish. — **N. d.** Miniyet-Murshid. — **D. i.** El-Qantara; Sâlihiya. — **R.** Qoseyr; Cap Zafarâra near Beanice.

Local name: Sabta (Forsk.); hatab-haddady; hamd; qullam.

Also known from Europe, the other parts of North Africa, the Orient and Central Asia.

145. (10.) **Arthrocnemon** Moq.

Flowers very small, bisexual. Perianth funnel-shaped, shortly 3—4-lobed. Stamens 2—1. Ovary ovoid; style short, branches 2; ovule suspended on a basal funicle. Seed vertical; embryo peripheric round the albumen. — Small shrubs; stem branched, of short joints. Leaves 0. Flowers in cylindric dense spikes; in clusters of 3 sunk in the hollows of the joints.

A small genus of about 7 species, in saline marshes of the Old World.

354. **Arthrocnemum glaucum** (Del.) Unger-Sternb. in Atti Congr. Bot. Firenze (1874), p. 283. — Boiss. Fl. Or. IV, p. 932. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 172 no. 887. — Sickenberg. Contrib. Fl. d'Eg., p. 270. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 665. — *Arthrocnemum macrostachys* Hiern Cat. Afr. Plants Welw. I.

p. 899, partly. — *Halocnemum glaucum* Presl. Bot. Bemerk., p. 109. — *Salicornia glauca* Del. Ill. Flor. d'Eg., p. 69. — *Salicornia virginica* Forsk. Flor. aeg-arab., p. 2. — Glabrous; stem erect, branched, 12 to 40 cm high. Fruiting spikes 2—6 cm long, 4—4.5 mm broad, rough i. e. not forming smooth cylinders, the flowers being partially emergent. — Flow. March to April.

M. ma. Marmarica; Mariut; Mex; Alexandria; Abukîr. — **M. p.** Rosetta; Damietta, Qatiya; Lake Menzale; Port Said. — **D. i.** El-'Arish.

Local name: Khreysy (Forsk.); Shimam (Schweinfurth); Shinan (Schweinfurth, Klunzinger, Muschler); hideyd; hatab; shakhûkh; hatab zeyta; qullûm; hamel.

Also in the other parts of North Africa, Europe, and the Orient.

146. (11.) *Salicornia* Linn.

Flowers mostly perfect, deeply sunk by threes in the rhachis of the jointed spike, in the axills of cup-shaped decussately opposite bracts, the lateral ones of each cluster lower and often only male. Calyx a fleshy rhomboidal sac with an anterior opening (or formed by two bracts united above and below), enclosing the flower and fruit, adherent by a narrow line to the rhachis, at length thickened and spongy and finally deciduous. Stamens 1 or 2, with large oblong anthers on short filaments, exerted in flower. Styles 2 or 3, short. Pericarp membranous, adherent to the vertical obovate-oblong seed. — Low fleshy leafless saline plants, mostly herbaceous, with oppositely branched jointed stems; spikes cylindrical.

A small genus of about 9 species, on the sea-costs of the world.

A. Perennial, erect, spikes obtuse 1. *S. fruticosa*.

B. Annual, mostly procumbent, spikes attenuate 2. *S. herbacea*.

355. (1.) *Salicornia fruticosa* L. Spec. Plant. I (1753), p. 5. — Boiss. Flor. Or. IV, p. 932. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 127 no. 888. — Sickenberg. Contrib. Fl. d'Eg., p. 270. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 665 no. 276. — *Salsola arabica* L. Spec. Plant. I, p. 3. — *Salicornia europaea* Forsk. Flor. aeg-arab., p. 2. — Shrubby, 30 to 40 cm high; stems and first branches often rooting below, decussate branched. Spikes cylindrical or cylindrical-club-shaped, obtuse; cells of the floral cup 3, side by side; tip of the perianth of the middle flower pentagonal or trapezoidal. Flow. March to June.

M. ma. Marmarica; Montaza; Alexandria-West; Mex; Ras el-Kenais; Abukîr. — **M. p.** Rosetta; Port Said; Damietta; El-'Arish. — **N. d.** Miniet-Murshid. — **O.** Little Oasis. — **D. i.** Ismailia.

Local name: Khreysy; hatab haddade; abu-saq, bu saq (Delile); bawal; ghassul; hamd (Ascherson); mulleyh (Ascherson-Muschler).

Also known from all the other parts of the Mediterranean region.

356. (2.) **Salicornia herbacea** L. Spec. Plant. I (1753), p. 5. — Boiss. Flor. Or. IV, p. 932. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 127 no. 889. — Sickenberg. Contrib. Fl. d'Eg., p. 270. — Aschers.-Schweinf. Primit. Fl. Marmaric., p. 665 no. 277. — In its simplest forms this is a glabrous, bright green, succulent, erect annual, scarcely 12 to 14 cm high, with few, erect branches, each one terminated by a spike, 1 to 2,5 cm long. When luxuriant, after the first flowering, branches shoot out from every joint or node as well as from the spike itself, the lower ones become hard, and often procumbent, rooting at the nodes, and the whole plant will extend to 30 cm or more. — Flow. February to April.

M. ma. Marmarica; Abusir; Mariut; Alexandria-West and East. — **M. p.** Edku; Rosetta; Damietta. — **N. d.** Menzale; Rosetta, in rice-fields; Gasatin; Salihiya. — **N. f.** Mouth of the Bahr-el-Wady.

Local name: Khreys.

Also known from Europe, Tunisia, Algeria, Asia.

147. (12.) **Suaeda** Forsk.

Flowers minute, sessile or nearly so, axillary, solitary or clustered, usually bisexual; bracts and bracteoles minute, scarious. Perianth short, fleshy, 5-lobed or-partite; lobes or segments equal or unequal, without appendages or more or less carinate or crested or slightly winged, enclosing the fruit. Stamens 5, short. Styles 2—5, short, subulate, recurved. Utricle included in the perianth, membranous or spongy; pericarp thin, usually free from the seed. Seed horizontal, vertical or oblique; testa crustaceous or coriaceous; albumen wanting or scanty; embryo flat, spirally rolled. — Glabrous herbs or shrubs. Leaves alternate, fleshy, thick or terete, entire.

A widely distributed genus of about 40 species, usually found on seashores or in saline places.

A. Shrubby.

I. Each leaf without a tubercle supporting at its base; stigmas purple.

a) Upper leaves nearly 2,5 to 3 cm long . . . 1. **S. monoica.**

b) Upper leaves much less than 2 cm long.

1. Stigmas 3, broad, bilobed; leaves semi-

terete 2. **S. vera.**

2. Stigmas 3, narrow-linear or filiform; leaves terete.
 α) Leaves acute, not mucronate 3. *S. fruticosa*.
 β) Leaves acute, mucronate 4. *S. pruinosa*.
 II. Each leaf with a tubercle supporting at its base; stigmas yellow 5. *S. vermiculata*.
 B. Annuals, often with indurated base.
 I. Glabrous; leaves semiterete, obtuse 6. *S. salsa*.
 II. Pulverulent; leaves acute, terete 7. *S. splendens*.

357. (1.) **Suaeda monoica** Forsk. Flor. aeg.-arab. (1775), p. 70. — Boiss. Fl. Or. IV, p. 940. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 127 no. 895. — Sickenberg. Contrib. Fl. d'Eg., p. 270. — Shrubby. 20 to 50 cm high; branches erect, yellowish, twigs, spreading or drooping, leafy. Leaves fleshy, oblong-linear, 1 to 2 cm long, 2 to 3 mm broad, flattish, obtuse. Panicle terminal, compound, short. Flowers polygamous; clusters sessile, 1—3-flowered, forming short terminal, rather loose spikes; floral leaves elliptical, tapering at the base, the upper shorter than the flowers; fruiting perianth crimson, obovate-oblong, 2 mm long; seed vertical, glossy, somewhat beaked. — Flow. March.

O. Little Oasis; Dakhel; Great Oasis. — **R.** Qoseyr: Wady Gadire.

Local name: 'Asal (Forsk.); Khriyet (Ascherson-Schweinfurth): hamd (Ascherson).

Also in the other parts of the Mediterranean region, tropical Africa, extending to western India.

358. (2.) **Suaeda vera** Forsk. Flor. aeg.-arab. (1775), p. 69. — Boiss. Fl. Or. IV, p. 999. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 127 no. 894. — Sickenberg. Contrib. Fl. d'Eg., p. 270. — *Suaeda fruticosa* Aut. not Forsk. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 127 no. 893. — Sickenberg. Contrib. Fl. d'Eg., p. 270. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 665 no. 279. — A glabrous, much branched shrub. 30 to 60 cm high. Leaves alternate, scattered, linear, semiterete, acute, sessile, narrowed at the very base, without any tubercle supporting beneath; leaves on the branches usually 6—7 mm long, the lower leaves longer, often 1—1.3 cm long. Flowers very small, axillary, many solitary, bisexual, some in few-flowered clusters. Perianth broadly cylindric in bud, hardly at all pentagonal. — Flow. April.

M. ma. Marmarica: Ras-el-Kenais; On calcareous rocks near Alexandria; in sandy places and on way-sides. — **M. p.** Brullus; Lesbe near Damietta; on sandy hills near Damietta everywhere; Port Said. — **N. d.** Miniet-Murshid; in ditches near Sâlihiya, common.

Local name: Sueyd; Hemmam (Forsk.); Sabta (Ascherson); hatab; shûsh-el-gariye (Ascherson).

Also known from the other parts of the Mediterranean region.

var. **brevifolia** (Boiss.) Schweinfurth and Muschler comb. nov. — *Suaeda fruticosa* var. *brevifolia* Boiss. Flor. Or. IV, p. 939. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 127 no. 893. — Sickenberg. Contrib. Fl. d'Eg., p. 270. — Leaves much smaller and shorter. — Flow. March to April.

M. ma. Alexandria-West (Maire) on calcareous ground.

Also known from South Europe.

359. (3.) **Suaeda fruticosa** Forsk. Flor. aeg.-arab. (1775), p. 70 not Aut. — Boiss. Flor. Or. IV, p. 939. — Schweinf. in Bull. l'Herb. Boiss. (1894), p. App. II, p. 157. — Perennial, 50 cm to 1 m high or more; branches white, stiff, leafy. Leaves fleshy semiterete, linear-cylindric, 1—1.5 cm long, 1—2 mm broad, the floral smaller. Clusters sessile, 1- to 5-flowered, forming long rather dense, leafy spikes; flowers perfect; perianth nearly globular, 1 mm broad, lobes ovate, concave, obtuse, incurved at the tip; seed usually vertical, glossy, smooth. — Flow. March to April.

R. Red Sea Coast, everywhere.

Also known from Arabia.

360. (4.) **Suaeda pruinosa** Lange in Kjoeb. Vidensk. Meddel. (1861), p. 45. — *Suaeda fruticosa* Coss. in Bull. Soc. Bot. Franc. XXII, p. 50 not Forsk. — Perennial, 30 to 50 cm high, stems often hard and almost woody at the base, branched from the base, branches tortuous, divaricate, pubescent at the tip. Leaves ovate, globose, very short, densely imbricate, pruinous, glaucous, sessile, thickened at the base. Flowers small, greenish, perfect; perianth nearly globular, lobes ovate, concave, obtuse, incurved at the tip. Utricle membranous. Seed horizontal or very rarely vertical, dark reddish-brown, shining. — Flow. March to April.

M. ma. Mariut-Mergheb. — **N. d.** Kafr Dowar, on the margin of ditches. — Damietta.

Also known from Tunisia, Algeria and Southern Spain.

361. (5.) **Suaeda vermiculata** Forsk. Flor. aeg.-arab. (1775), p. 70. — Boiss. Fl. Or. IV, p. 940. — Forsk. Ic., tab. 18, fig. B. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 127 no. 896. — Sickenberg. Contrib. Fl. d'Eg., p. 270. — Aschers. Flor. Rhinocol., p. 803 no. 217. — *Suaeda monoica* Desf. Flor. Atl., p. 218. — *Salsola globulifera* Poir Dict. VII, p. 298. — Perennial, 20 to 30 cm high; branches whitish, divaricate, intricate. Leaves succulent, 5 to 10 mm long,

3 to 4 mm broad (resembling those of a *Sedum*), the lower obovate-oblong, the upper nearly globular. Flowers perfect, solitary or 2 to 3 in a cluster, shorter than the floral leaves, in short, loose spikes; fruiting perianth 1 mm broad ovate, lobes connivent; seed vertical, not beaked. — Flow. March to June.

M. ma. Bir Burdan; Abusir; Alexandria-West and Alexandria-East; Mandara; Abukîr. — **M. p.** Edku; Rosetta; Damietta, in sandy places. — **N. d.** Damietta; eastern coast of Lake Menzale; Sâlihiya. — **D. l.** Wady Natrûn. — **D. i.** Everywhere in sand dunes; Bir Abu-Ballah; Gebel Ekhfên; El-Kharuba. — **D. a. sept.** Wady Dugla. — **R.** Ras-Benass; Qoseyr.

Local name: Sueyd.

Also known from Tunisia, Algeria, Arabia petraea, Mesopotamia and Persia.

362. (6.) **Suaeda salsa** Pall. Ill. (1803), p. 46. — Boiss. Fl. Or. IV, p. 942. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 128 no. 897. — Sickenberg. Contrib. Fl. d'Eg., p. 270. — *Schoberia salsa* C. A. Mey. Flor. Altaic. I, p. 402. — A much branched, glabrous, erect or diffuse annual herb, varying in height from 15 to 40 cm; stems often hard, glaucous. Leaves sessile, 2—3 cm long, linear, semiterete, acute, submucronulate, thick and succulent. Flowers small, greenish; clusters 1—2—3-flowered, sessile, each flower usually with 1 bract and 2 bracteoles. Fruiting perianth depressed, about 2 mm diameter, 5-lobed; lobes ovate-rounded, appressed to the utricle. Utricle membranous. Seed horizontal or very rarely vertical, dark reddish-brown, shining. — Flow. April to June.

M. ma. Alexandria-East and Alexandria-West. — **N. d.** Sherbîn. — **M. p.** Rosetta; Damietta; Port Said.

Also known from Hungary, Southern Russia and Siberia.

363. (7.) **Suaeda splendens** (Pourr.) Godr. Gren. Flor. Lorr. III (1844), p. 30. — *Suaeda setigera* Moq. in DC. Prodrôm. XIII, p. 168. — Boiss. Fl. Or. IV, p. 942. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 128 no. 898. — Sickenberg. Contrib. Fl. d'Eg., p. 271. — *Chenopodium setigerum* DC. Catal. Hort. Monsp., p. 94. — *Schoberia setigera* C. A. Mey. Fl. Altaic. I, p. 402. — *Suaeda Balansae* Boiss. Diagn. Ser. II, 4, p. 75. — *Schoberia acuminata* C. A. Mey. Fl. Altaic. I, p. 198. — *Suaeda gracilis* Moq. in DC. Prodrôm. XIII, p. 157. — *Suaeda monantha* C. Koch in Linnæa XVII, p. 313. — *Suaeda longifolia* C. Koch in Linnæa XXII, p. 188. — A much branched, annual, mealy herb, varying in length from 10 to 40 cm; stems elongate, sometimes paniculate. Leaves fleshy, terete, cylindrical subulate, acuminate, sometimes with a small setula, the floral abbreviate, a little longer than the flowers. Clusters axillary 3—5-

flowered; flowers forming long leafy, loose spikes; fruiting perianth fleshy, inflate, lobes obtuse, convex; seed vertical or horizontal, shining. — Flow. March to April.

N. d. Mansura (Schweinfurth); Damietta (Sieber; Schweinfurth).
Also known from Southern Europe and Sibiria.

148. (13.) **Schanginia** C. A. Mey.

Flowers perfect or polygamous, solitary or clustered, subtended by minute, scale-like bracts. Perianth urn-shaped, adnate to the ovary, the five fruiting lobes furnished with a tubercle, or inflated, or unchanged. Stamens 5, inserted on the perianth. Stigmas 2—3. Utricle membranous, adnate to the perianth. Seed vertical, crustaceous, exalbuminous, beaked at the base. — Herbs or shrubs with aspect of Suaeda.

A small genus of only 2—3 species in the Orient.

- A. Annual; leaves fleshy, semi-terete, linear-cylindrical;
lobes of the fruiting perianth spongy 1. **S. baccata**.
- B. Perennial; leaves linear, acute, elongate; lobes of the
fruiting perianth not spongy 2. **S. hortensis**.

364. (1.) **Schanginia baccata** (Forsk.) Moq. in DC. Prodr. XIII (1849), p. 119. — Suaeda baccata Forsk. Flor. aeg.-arab. (1775), p. 69. — Boiss. Fl. Or. IV, p. 944. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 128 no. 899. — Sickenberg. Contrib. Fl. d'Eg., p. 271. — Aschers.-Schweinf. Suppl., p. 771. — Aschers. Flor. Rhinocol., p. 803 no. 218. — Enchylaena aegyptiaca Spreng. Syst. I, p. 923. — Annual, 20 to 30 cm high, glabrous, glaucous, more or less mealy, branching from the neck, densely leafy; the lateral branches spreading, the central ones often erect. Leaves fleshy, semi-terete, linear-cylindrical, 1.5—2 cm long, 1 mm broad, spreading, the floral much longer than the flowers. Flowers perfect, clustered, forming long, leafy spikes, loose below, denser above; fruiting perianth top-shaped, as large as a hemp seed, the lobes ovate, gibbous-inflated, spongy; seed beaked, smooth. — Flow. February to March.

M. ma. Abusîr; Alexandria-East and -West; 'Azahet-es-Siut; Mandara. — **M. p.** Rosetta; Geziret-el-Khudra; Kôm Mastara; Damietta. — **N. d.** Mansura; Birket-el-Hadj near Cairo. — **N. f.** Medînet-el-Fayûm; on way-sides near Ebgiç; allways as a weed in gardens. — **N. v.** Siut, in gardens as a weed (Schweinfurth). — **O.** Dakbel; Great Oasis; Ramlet-el-Ekhfên. — **D. i.** El-'Arish. — **D. a. sept.** El-'Abbâssiya.

Local name: mulleyh (Forsk.); tahama (Klunz.); tartîr (Ascherson).
Also known from Tropical Arabia.

365. (2.) **Schanginia hortensis** (Forsk.) Moq. Tand. in DC. Prodr. XIII (1849), p. 120. — Boiss. Flor. Or. IV, p. 948. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 128 no. 900. — *Salsola divergens* Poir. Dict. VII, p. 299. — *Suaeda hortensis* Forsk. Flor. aeg.-arab., p. 71. — *Chenopodium hortense* Roem. and Schult. Syst. VI, p. 208. — Perennial, suffrutescent, glabrous, more or less mealy, erect; branching from the base, branches woody at the base, white. Leaves linear, acute, elongate. Flowers bisexual, forming long, leafy spikes, loose below, perianth-lobes attenuate at the base, concave, immutate, divergent; seed pyriform, rostrate, shining, black, subpunctulate. — Flow. February to March.

M. ma. M. p. N. d. N. f. N. v. D. a. mer. D. a. sept. O. Always in deep sand and often as a weed in gardens.

Local name: mulleyh (Forsk.); tartir (Delile-Muschler); tahama (Klunz.) qataf (Aschers.-Schweinf.) sête (Schweinfurth-Muschler).

Also known from Tropical Arabica.

149. (14.) **Traganum** Del.

Flowers perfect, bibracteate, axillary. Perianth 5-fid, in fruit thickened below, nut-like, furnished in front and behind with a hornlike, conical, obtuse, hard protuberance, the lobes membranous, wingless. Disk small. Staminodes 0. Stamens 5, with broad, exerted filaments. Anthers sagittate, acute. Style bifid, stigmas filiform. Utricle somewhat depressed, included in the woody perianth. pericarp membranous. Seed horizontal. — Branched shrubs; branches not pointed.

A small genus of about 2 species in the Mediterranean region.

366. **Traganum nudatum** Del. Ill. Flor. d'Eg. (1813). p. 230 tab. 22 fig. 1. — Boiss. Flor. Or. IV. p. 946. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 128 no. 901. — Aschers. Flor. Rhinocol., p. 803 no. 219. — Moq. in DC. Prodr. XIII, 2, p. 171. — Shrubby, 20 to 50 cm high, divaricate-branched; the branchlets slender, intricate, white, glabrous or scabridulous. Leaves alternate, 4—5 mm long, distant, fleshy, triquetrous, oblong, mucronate, somewhat recurved, keeled. Axils fleecy; flowers 1—3 in a cluster, bracteoles ovate-triquetrous, a little shorter than the floral leaf; calyx-lobes membranous, oblong-lanceolate, obtuse, erect. — Flow. March to May.

M. ma. Alexandria; Mustapha-Pasha; Abusir. — **M. p.** El-'Arish. — **D. l.** Between Maragh and Farâfra; Desert near Siwa; Between Farâfra and Bir Dakr. — **D. i.** Sâlihiya, in salt ditches; Maxama in Wady Tumilat; Bir-abu-Ballah; El-Qantara; El-'Arish. — **D. a. sept.**

Serapeum; Wady-Hof; S. W. of Mgheta; Wady Maraq; Mouth of the Wady Gendeli; Wady Kherese; Siut.

Local name: feres (Caillaud); hamd (Wilkins.; Schweinfurth); thirr (Schweinfurth); Zamrân (Ascherson-Muschler).

Also known from Tunisia, Arabia Petraea and Palestina.

150. (15.) **Seidlitzia** Bunge.

Flowers perfect, bibracteate, axillary, opposite, solitary or 2—3 in a cluster, the lateral often withering. Staminodes 5, semi-orbulate, glandular-ciliate, united into a staminate disk; filaments 5, exserted, anthers muticous. Leaves of perigonium 5, united at the base, elliptical, obtuse or bilobed, in fruit parchment-like, furnished toward the middle with broad, membranous, transverse wings, the posterior wing spoonshaped, bent forward, covering the fruit, the others spreading. Style minute, with two stigmas at the tip. Utricle depressed. Seed horizontal. — Annual herbs or shrubs, with jointed stems and branches, and opposite leaves.

A small genus of about 3 species in the Orient.

367. **Seidlitzia Rosmarinus** Bunge in Boiss. Flor. Or. IV (1879), p. 951. — Sickenberg. Contrib. Fl. d'Eg., p. 271. — Suaeda Rosmarinus Ehrenberg in exsicc. — Shrubby; stems erect, branching from the base; branches opposite, glabrous, white, spreading or sometimes decumbent. Leaves fleshy, opposite, semi-terete, obtuse, flaccid, the lower internodes elongate, the floral internodes abbreviate. Flowers in clusters, 3—5-flowered; bracteoles ovate, obtuse, longer than the flower, membranous-margined. — Flow. March.

D. a. sept. Wady-Dugla; Bir Mûsa near Cairo (Sickenberger).

Also known from tropical Arabia.

151. (16.) **Haloxylon** Bunge.

Flowers perfect, bibracteolate. Perigonium 5-parted, the leaves growing after flowering into spreading, scarious, transverse wings. Staminodes 5, united into an urn which is connate with the filaments, but free at the tip. Anthers muticous. Style short or 0, stigmas 2—4. Utricle top-shaped, concave above, fleshy, enclosed in the open perigonium. Seed horizontal. — Shrubs, with jointed branches, usually opposite, connate, rudimentary or minute leaves, and solitary, axillary flowers. — Distinguished from *Salsola* by jointed stems, staminodes, and monadelphous filaments.

A small genus of only 7—12 species in all the parts of North Africa, Southern Europe and Central Asia, India.

- A. Blackish when dry; branches slender . . . 1. **H. articulatum**.
 B. Pale yellow when dry; branches robust . . 2. **H. Schweinfurthii**.

368. (1.) **Haloxylon articulatum** Bunge in Act. Hort. Petrop. VI (1879), p. 439. — Boiss. Fl. Or. IV, p. 949. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 128 no. 902. — Supplement p. 771. — Aschers. Flor. Rhinocol., p. 803 no. 220. — Sickenberg. Contrib. Fl. d'Eg., p. 271. — Aschers.-Schweinf. Prim. Flor. Marmar., p. 666 no. 280. — *Salsola articulata* Cav. Ic. III, tab. 284. — *Caroxylon articulatum* Moq. in DC. Prodom. XIII, 2, p. 175. — Shrubby, 30 to 50 cm glabrous, green. Leaves scale-like at the tip of joint, short-triangular, connate into a cup which is minutely villous within. Stamens shorter than ovary; style short; stigmas 2, divergent; fruit with wings 5 mm to 9 mm across, wings nearly equal, obovate-orbicular, with eroded margins. — Flow. October and November.

M. ma. Bîr-el-qasaba; Qasr-el-Adjedabîyeh (Ehrenberg); Matruqa, El-'Awâmid; Mirsa Tobruk. — **M. p.** El-'Arish; Gebel Ekhfên; El-Grady. — **O.** Siwa.

Local name: Belbel (Ehrenberg); tafwa (Junker).

Also known from Tripolitania, Fezzan, Cyrenaica, Marmarica, Tunisia, Algeria, Morocco, Spain, Arabia Petraea and Syria.

369. (2.) **Haloxylon Schweinfurthii** Ascherson in Aschers. and Schweinf. Ill. Flor. d'Eg. (1887), p. 128 no. 903. — Sickenberg. Contrib. Fl. d'Eg., p. 271. — *Salsola articulata* Decne. Flor. sinaic. not Forsk., not Cav. — *Anabasis articulata* Moq. in DC. Prodom. XIII, 2, p. 212. — Boiss. Fl. Or. IV, p. 970 ex parte. — Shrubby, glaucous, pale yellow when dry, branching from the base; branches and branchlets erect, robust. Leaves scale-like at the tip of joint, short-triangular, connate into a cup which is minutely villous within. Flowers in spikes; spikes elongate, dense; bractlets rotundate-ovate, fleshy, concave, obtuse, lanate at the base; wings 3 to 6 mm long, palish-yellow, semi-orbicular, truncate at the base; stigmas 2, erect. — Flow. October to November.

O. Siwa. — **D. l.** Birket-el-Qarûn. — **D. a. sept.** Wady Dugla; Helwân; Gebel Iswid; Great Petrified Forest; Bîr-el-Fahme; Wadis in the talle-lands above 800 m.

Only known from Egypt. — Closely allied tho the western *Haloxylon Schmittianum* Pomel. but a larger plant with smaller leaves, and with the flowers in smaller, denser spikes.

152. (17.) **Salsola** Linn.

Flowers small, solitary or fascicled, axillary, bisexual, 2-bracteolate. Perianth 4—5-partite; segments concave, thickened down the

back, enlarged in fruit and furnished with a horizontal wing or protuberance, completely enclosing the utricle. Stamens 5, rarely fewer. Styles 2—3, subulate, erect or recurved. Utricle ovoid or orbicular; pericarp fleshy or membranous, not adherent to the seed. Seed usually horizontal, orbicular; testa membranous; albumen wanting; embryo spirally coiled. — Herbs or shrubs; branches not jointed. Leaves alternate or opposite, sessile, narrow-linear or terete, often pungent.

Species estimated at about 40, widely spread in saline localities, but mainly in temperate regions.

A. Annuals.

- I. Papillose-mealy plants; leaves short-linear 1. *S. inermis*.
- II. Hirsute or glabrescent plants; leaves lanceolate, hairs simple 2. *S. Kali*.
- III. Villose plants; hairs ramose 3. *S. Volkensii*.

B. Perennials.

- I. Branches and leaves opposite.
 - a) Branches and leaves pubescent.
 1. Branches tetragonal-cylindrical, internodes 3—5 mm long 4. *S. tetrandra*.
 2. Branches tetragonal; internodes 1 to 2 mm long 5. *S. Pachoi*.
 - b) Branches and leaves glabrous, sparingly mealy 6. *S. longifolia*.
- II. Branches and leaves alternate.
 - a) Villous plants with denticulate yellow hairs 7. *S. foetida*.
 - b) Villous plants with simple white hairs . 8. *S. vermiculata*.

370. (1.) **Salsola inermis** Forsk. Flor. aeg.-arab. (1775), p 57. — Boiss. Fl. Or. IV, p. 955. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 129 no. 905. — Sickenberg. Contrib. Fl. d'Eg., p. 271. — Forsk. Ic., tab. 8, fig. B. — *Salsola villosa* Sieb. in exsicc. non Del. — Annual, 10 to 50 cm high, at length indurated, papillose-mealy; stems prostrate or ascending, or branching from neck. Leaves small, the lowermost soon deciduous, half-clasping, short-linear, acutish, the upper and floral ovate-triquetrous, the latter imbricated. Flowers small, solitary, loosely spiked along the branches; bracteoles orbicular, mucronulate, about as long as the floral leaf; divisions of fruiting perianth mealy; triangular, connivent into a disk; wings inserted at their middle, obovate, sinuate at margin, produced to the base of the perianth in an elevated nerve. — Flow. February to July.

M. ma. Abusir; common plant everywhere near Alexandria-West and -East; Mandara; Abukir. — **M. p.** Rosetta; Damietta; Port

Said. — **N. d.** Damanhur; Zaqa'iz; environs of Cairo, rare. — **D. i.** Abu Roash; Pyramids of Giza and Saqqâra.

Local name: Qumeily; nedâwa (Forsk.).

Also known from Syria and Arabia.

371. (2.) **Salsola Kali** L. Spec. Plant. I (1753), p. 222. — Boiss. Fl. Or. IV, p. 954. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 128 no. 904. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 666 no. 281. — A rigid procumbent or diffusely branched herb, 15 to 25 cm long; stem stout, grooved and angled, scabrid-pubescent or almost glabrous; branches spreading, often striped. Leaves spreading and recurved, variable in size, 0.63-2.5 cm long or more, ovate-subulate with a rigid pungent point, sheathing at the base, thick and fleshy, semi-terete; the uppermost shorter and broader, almost triangular. Flowers solitary and sessile in the axils of the leaves, sometimes appearing clustered from the reduction of axillary flowering branches, each flower with 2 opposite bracteoles; floral leaves and bracteoles all pungent. Fruiting perianth about 0.63 cm diameter, shorter than the bracteoles, 5-partite; segments rigid and cartilaginous at the base, furnished above with 5 broad spreading scarious wings. — Flow. March to June.

M. ma. Râs-el-Kenâis; Abusîr; Alexandria-East and -West, not rare in sandy places; Mandara. — **M. p.** Rosetta; Brullus; Damietta. — **D. i.** El-'Arîsh. — **N. d.** Damanhur; Mehallet-el-Kebîr; Mansura; Tanta; Benha-el-'Asal; Qalyûb; Cairo.

Local name: shôk; shôk ahmar; ghobeyrâ (Ascherson, Muschler).

A widely dispersed plant in most temperate and tropical regions.

372. (3.) **Salsola Volkensii** Schweinfurth and Aschers. in Ill. Fl. d'Eg. (1887), p. 130 no. 912. — Sickenberg. Contrib. Fl. d'Eg., p. 271. — An annual, white-glaucous herb; stems villous, erect, branching from the base, to 27 cm high. Leaves semi-terete, fleshy, obtuse, the upper ones abbreviate, the floral ones shorter than the orbicular bracteoles. Flowers solitary, loosely spicate; lobes of the perianth villous-pubescent, oblong-lanceolate, acute, discoid-connivent, wings imbricate. — Flow. November to March.

M. p. Rosetta, not common. — **N. d.** Very abundantly near el-Qoreyn and Abu-Hammâd; Tell-el-Kebîr; Maxama. — **D. i.** Sâlihiya. — **D. a. sept.** Wady Warâg; Helwân.

Local name: Heley-ou (Ascherson). — Sirr; arembelh (Schweinfurth).

Only known from Egypt.

373. (4.) **Salsola tetrandra** Forsk. Flor. aeg.-arab. (1775), p. 58. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 129 no. 906. — Sickenberg.

Contrib. Fl. d'Eg., p. 271. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 666 no. 282. — *Salsola tetragona* Del. Fl. d'Eg. (1813), p. 204 (ed. folio), p. 230 (edit. 8^o) tab. 22, fig. I. — Boiss. Fl. Or. IV, p. 946. — Moq. in DC. Prodom. XIII, 2, p. 171. — *Caroxylon tetragonum* Moq. in DC. Prodom. XIII, 2, p. 176. — Perennial, more or less papillose-pubescent and white; branches tortuous, the lower ones spreading. Leaves minute, scale-like, fleshy, short-triangular-ovate, obtuse, densely imbricated along the short, catkin-like, tetragonal-cylindrical branches of the inflorescence. Flowers axillary, solitary, the catkins spiked; bracteoles ovate, obtuse, concave, similar to the leaves; lobes of the fruiting perianth lanceolate, connivent in a cone, silky at the outer face; wings small, inserted below the middle of the perianth. — Flow. all the year round.

M. ma. Mandar; Râs-el-Kenais; Matruqa; Almaïda, not common; Mex; Montaza; Mariut; Abusir; Sidi-Gâber, not common; Ramle; Mandara. — **M. p.** Gebel Ekhfên. — **D. l.** Beni-Selâma, in deep sand; Kafr Hakîm near Abu Roash; Pyramids of Zâwiyet-el-'Aryân. — **D. i.** Gebel-Ekhfên. — **D. a. sept.** Wady Khafûra; Wady Warâg, in great abundance: in the Wady Omm Dhamarana; Mouth of the Wady Djaffara near Belbes; Wady Khafura; Upper part of the Wady Na-umiye.

Local name: 'Arâd; Djill (Ehrenberg); zamrân, damrân (Schweinfurth).

Also known from Tunisia, Algeria, Morocco, Arabia Petraea and Palestine.

374. (5.) **Salsola Pachoi** Volkens and Ascherson in Aschers. and Schweinf. Ill. Fl. d'Eg. (1887), p. 130 no. 907. — Sickenberg. Contrib. Fl. d'Eg., p. 271. — Aschers.-Schweinf. Primit. Flor. Marm., p. 666 no. 283. — Perennial, more or less sericeous-pubescent and white; branches tortuous, the lower ones spreading like in *Salsola tetrandra* but the internodes much shorter and the habit more robust. Leaves minute, scale-like, fleshy, short-triangular-ovate, obtuse or rarely subacute, densely imbricated along the short, catkin-like tetrandrous branches of the inflorescence. Flowers axillary, solitary, the catkins spiked; bracteoles ovate, obtuse, concave, mostly similar to the leaves; lobes of the fruiting perianth lanceolate-ovate or ovate, connivent in a cone, silky at the outer face; wings small, inserted below the middle of the perianth. — Flow. January to March.

M. ma. Râs-el-Kenais. — **D. d.** Abundant in the desert ground near the Pyramids of Gîza, Zâwiyet-el-'Aryân and Saqqâra.

Local name: damrân (Muschler).

Only known from these localities.

375. (6.) **Salsola longifolia** Forsk. Flor. aeg.-arab. (1775), p. 55. — Boiss. Fl. Or. IV, p. 957. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 130 no. 908. — Sickenberg. Contrib. Fl. d'Eg., p. 271. — *Salsola Sieberi* Presl Bot. Bemerk. in Abhandlg. d. k. böhm. Gesellsch. d. Wiss. 5. Folge, III (1844), p. 538. — Seveda Schimper Moq. in DC. Prodom. XIII, 2, p. 154. — Boiss. Fl. Or. IV, p. 986. — Aschers.-Schweinf. Primit. Fl. Marmar., p. 666 no. 284. — Solms-Laubach: Ueber die in der Oase Biskra vorkom. spirolob. Chenop. in Bot. Ztg. 1901, p. 159 to 186. — 30 to 50 cm high; glabrous, sparingly mealy; branches ascending or erect, short, stiff, with short twigs. Leaves fleshy, linear, terete-triangular, obtuse, the floral oblong, hooded, obtuse, longer than concave, orbicular bracteoles. Flowers opposite along the twigs, forming long and loose or short and dense spikes; tube of fruiting perianth nearly globular, with elevated, longitudinal nerves, and somewhat pentagonal, basilar areola; lobes short-ovate, obtuse, wings orbicular, narrowed at the base. — Flow. October to January to April.

M. ma. Marmarica: Matruqa; Mex; Alexandria-West and -East, on calcareous ground; Mandara. — **D. a. sept.** Abundant in the Southern Galala; near the rail-way-station Genêff; Wady Kherêse; in the Upper Wady Warâg; Mouth of the Wady Gendeli; Wady Hof; Wady Dugla; Moqattam near Cairo; Helwân. on calcareous ground common, very rare in sandy places.

Local name: heydeyd (Schweinf.).

Also known from Algeria; Morocco; Turkish Marmarica, the Red-Sea-Coasts, Nubia and from Arabia.

376. (7.) **Salsola foetida** Del. Ill. Flor. d'Eg. (1813), p. 310. — Boiss. Fl. Or. IV, p. 961. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 130 no. 909. — Sickenberg. Contrib. Fl. d'Eg., p. 271. — *Caroxylon foetidum* Moq. in DC. Prodom. XIII, 2, p. 178. — *Salsola rigida* Pall. Ill., p. 20 tab. 12 pr. parte. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 130 no. 911. — Boiss. Fl. Or. IV, p. 962. — Sickenberg. Contrib. Fl. d'Eg., p. 271. — Aschers.-Schweinf. Suppl., p. 772. — Perennial, 45 to 80 cm high, villous with denticulate, yellow hairs; the old branches prostrate or ascending, the more recent slender, stiff, simple or paniculate-branched. Leaves alternate, filiform, 10 cm long, obtuse, spreading or recurved; axils bearing tufts of small leaves; floral leaves short, as long as or longer than flowers. Flowers solitary in loose or dense spikes; bracteoles ovate, keeled, often with herbaceous cusps; lobes of perianth villous, triangular-ovate, erect; wings arising about the middle, kidney-shaped, imbricated. — Flow. June to October.

O. Dakhel; Farâfra, not rare; Great Oasis, in great abundance (Ascherson-Schweinfurth). — **D. l.** In sandy fields Birket-el-Qurûn; Manfalut; Dendera; Thebes; Esne; 'between Gebel Gara' and Biba near Aswân. — **D. a. sept.** Wady Tarfe; Wady Abady; in the upper part of the Wady Dugla not common. — **D. a. mer.** Qoseyr.

Local name: Mulleyh (Delile); kherît; khriyet (Ascherson-Schweinfurth); tartîr; hâd; woqeyd, krish (Ascherson); generally khreyt.

Also known from Syria and Palestine, Nubia, Arabia, India and Senegal.

377. (8.) **Salsola vermiculata** L. Spec. Plant. I (1753), p. 323. — var. **villosa** (Del.) Moq. Tand. in DC. Prodrôm. XIII, 2 (1849), p. 154. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 130 no. 910. — Sickenberg. Contrib. Fl. d'Eg., p. 271. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 666 no. 286. — Boiss. Fl. Or. IV, p. 962. — Shrubby densely pubescent or sometimes canescent, branching from the base; branches ascendent or erect. Leaves dilatate at the base, semiamplexicaule, terete-filiforme very short, the floral ones ovate, sometimes shortly cuspidate, bracteoles ovate, membranous-margined. Flowers solitary, densely or loosely spicate; lobes of the perianth ovate-triangular, obtuse, pubescent, connivent at the base, wings obovate, imbricate, patulous. — Flow. January to March.

M. ma. El-²Arîsh. — **M. p.** Abusîr; Mergheb; on calcareous hills near Mex, abundantly; Mariut, common; Qasr-el-Adjedabiye. — **O.** Great Oasis, rare (Ascherson) Farâfra. — Dakhel, not common, in sand. — **D. l.** Between Gebel Gara' and Biban near Aswân; Pyramids of Saqqâra, very rare. — **D. a. sept.** Wady Warâg; Wady Gerrawi; Wady Dégele; Upper Wady Om-Ruthi; Upper Wady Dugla. — **D. a. mer.** Everywhere in the Galala; in the desert between Kene and Qoseyr.

Local name: thrith; khreyt; akhreyt; djell (Ehrenberg); museyhl (Ascherson); generally; hâd.

Also known from other parts of the Mediterranean region.

153. (18.) **Noaea** Moq. Tand.

Flowers perfect, solitary, bibracteate. Lobes of the perianth 5, short-connate at the base, all winged in fruit. Staminodes 0. Stamens 5, inserted on a fleshy, lobed disk. Anthers appendaged, lanceolate. Style elongated, stigmas lanceolate. Utricle membranous. Tip of radicle superior. — (Ours) shrubs, stem not jointed, leaves alternate.

A small genus of about 7 species in the Orient.

378. **Noaea mucronata** (Forsk.) Ascherson and Schweinfurth in Ill. Fl. d'Eg. (1887), p. 131 no. 913. — Sickenberg. Contrib. Fl. d'Eg., p. 271. — Aschers. Flor. Rhinocol., p. 804 no. 223. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 666 no. 287. — *Anabasis spinosissima* L. fil. Suppl., p. 173. — *Noea spinosissima* Moq. Tand. in Boiss. Flor. Or. IV, p. 965. — *Salsola mucronata* Forsk. Flor. aeg.-arab., p. 56. — *Salsola Echinus* Labill. Syr. Dec. 2, p. 10 tab. 5. — Del. Ill. Fl. d'Eg., tab. 21. — Shrubby, 20 to 50 cm high, glabrous, intricately branched from the base; branches rigid, flexuous, twigs spreading, bearing flowers from the base to the middle, spiny at the tip. Leaves alternate, semi-terete, filiform, mucronulate, the upper shorter. Floral leaves and bracteoles ovate at the base. triquetrous-subulate; flowers solitary in axils, often crowded at base of twig; wings of fruiting perigonium, obovate to oblong, longer than the lobes. — Flow. March to June.

M. ma. Marmarica, abundantly; Abusîr; Alexandria-West and -East; Montaza; Râs-el-Kenaïs. — **M. p.** El-'Arish. — **D. i.** Sâlihîya. — **D. a. sept.** Wady Dugla; Wady Hof; Wady Rished near Helwan.

Local name: Shôk-el-hanash (Forsk.); 'athirr, thîrr; dirr (Schweinfurth); sirr (Ascherson).

Also known from Algeria, Cyrenaica Marmarica, Greece, Syria, Asia minor, Armenia, Persia and Afghanistan.

154. (19.) **Anabasis** Linn.

Flowers perfect, bibracteate, solitary or rarely clustered. Leaves of the perianth free to the base. Anthers not appendaged, or minutely apiculate. Style divided to the base into two short, obtuse stigmas. Utricle membranous, sometimes berry-like. Tip of the radicle inferior. — Herbs or shrubs, with jointed stems, and opposite leaves, often reduced to scales.

A small genus of about 17 species in the Mediterranean region, Middle and Western Asia.

- A. 50 to 100 cm high or more; branches short; leaves reduced to a short, bilobed cupule, villous within; flowers solitary. 1. **A. articulata**.
- B. 30 cm high; branches elongated; leaves fleshy, horizontal, cylindrical-club-shaped, ending in a deciduous bristle; flowers 3—7 in a cluster. . . 2. **A. setifera**.

379. (1.) **Anabasis articulata** (Forsk.) Moq. Tand. in DC. Prodr. XIII. 2 (1849), p. 212. — *Salsola articulata* Forsk. Flor. aeg.-arab. (1775), p. 55. — Icon. tab. 8 fig. A. — Boiss. Fl. Or. IV, p. 670.

— Aschers.-Schweinf. Ill. Fl. d'Eg., p. 131 no. 914. — Sickenberg. Contrib. Fl. d'Eg., p. 272. — Aschers. Flor. Rhinocol., p. 804 no. 224. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 666 no. 288. — Shrubby, 50 to 100 cm high or more, with erect or tortuous, brittle branches. Leaves reduced to a short, bilobed cupule, villous within. Flowers opposite, solitary, the upper crowded at the tip of the branches; staminodes orbicular-obovate, short-ciliolate; wings of the fruiting perianth 5, striate, ovate-orbicular, sinuate. — Flow. November to February.

M. ma. Abusîr; Bîr-Burdân; Tabiet-el-Agmi; El-Dukhêla; Alexandria-East and West. — **M. p.** Damietta; Rosetta in sandy places; Rosetta not common in sandy places; El-Gels Mohammediye. — **O.** Siwa, not common; Little Oasis: Farâfra, in sandy and stony places; Dakhel. — **D. l.** Abu-Roash, in great abundance; near the Pyramids of Zâwîyet-el-'Aryân. — **D. i.** Gebel Ekhfên. — **D. a. sept.** Wady Hamâta; Bîr-el-Fahme; western desert near Cairo; Wady Hof, Northern Galala; Bîr-Suez near Suez; near Port Ibrahim, in sandy places; mouth of Wady Tih.

Local name: tartîr (Forsk.); 'agerâm; 'adjerâm (Ehrenberg, Schweinfurth); belbel (Ascherson-Muschler).

Also known from North eastern Sahara, Turkish Marmarica, Tripolitania, Fezzan, Tunisia, Algeria, Spain, Arabia Petraea and Syria.

380. (2.) **Anabasis setifera** Moq. Tand. in DC. Prodrôm. XIII. 2 (1849). p. 214. — Boiss. Fl. Or. IV. p. 970. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 131 no. 915. — Sickenberg. Contrib. Fl. d'Eg., p. 272. — *Anabasis lutea* Moq. in DC. Prodrôm. XIII. 2. p. 215. — Shrubby 30 cm high; stems numerous, erect or ascending, branches elongated. Leaves fleshy, horizontal, cylindrical-club-shaped. 8 to 10 mm long. 4 to 6 mm broad, ending in a deciduous bristle. Flowers 3—7 in a cluster in the upper axils, the lower clusters distant, the upper ones approximated; staminodes rounded-truncate, fimbriated; fruiting perigonium 5-winged, wings orbicular, nearly entire, somewhat unequal. — Flow. March to June.

D. a. sept. Wady Hof; Wady Dugla; Wady Kherêse; Galala; Wady Dakhel; Wady Hanashiye; Suez; Wady Hamâta (Schweinfurth).

Local name: Hamd; gillu (Schweinfurth).

Also known from Syria and Palestine.

155. (20.) **Cornulaca** Del.

Flowers bisexual, solitary or in clusters. Lobes of the perianth 5, connate at the base in a long excrescence, in the upper part free,

hyaline, denticulate; staminodes 5, connate with the filaments, longer than the ovary. Ovary laterally depressed: Radicle superior. — Shrubs or rarely herbs with subulate and often spinous leaves.

A small genus of 4 species, widely distributed in Egypt, Persia and Afghanistan.

381. **Cornulaca monacantha** Del. Ill. Flor. d'Eg. (1813), p. 234 tab. 22. — Boiss. Fl. Or. IV, p. 984. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 131 no. 916. — Shrubby, glaucous, branching from the base; branches elongate. Leaves at the base clasping, triquetrous-subulate, pungent, sometimes sublanate. Flowers 3—5 in clusters, lanate; lobes of the perianth linear-spathulate, obtuse, denticulate at the tip; staminodes half as long as the perianth; spines of the fruiting perianth subulate, longer than the lobes. — Flow. October to December.

O. Little Oasis, in sandy ground abundantly; Farâfra; Dakhel, not rare; Great Oasis. — **D. l.** Abu-Roash; Saqqâra; Between Farâfra and Bîr Dîkr; everywhere in sandy ground near the Pyramids of Giza. — **D. i.** Sâlihiya; Bîr-Abu-Ballah; Ismailia, in sandy fields very abundantly; Serapeum near Suez. — **D. a. sept.** Everywhere near Suez; Sand Dunes near Mghêta; desert near Esne, abundantly; Wady Alburûk, south of Qoseyr. — **D. a. mer.** Berenice.

Local name: hâd.

Also known from Middle Persia and Afghanistan.

156. (21.) **Agathophora** Bunge.

Flowers by abortion polygamous, clustered in the axills. stipitate in dense wool, the middle one bractless, the outer two with 2—3 bracteoles. Leaves of the perianth five, nearly free, the two outer winged or gibbous at the back. Staminodes 4—5, connate with the filaments. Stamens 5, rarely 3 or 2, anthers with a short appendage or 0. Ovary ovate, style short, stigmas 2, filiform. Radicle superior. — Shrubs or sometimes annual herbs, with fleshy leaves.

A small genus of only one species, widely distributed in Algeria, Egypt and Arabia.

382. **Agathophora alopecuroides** (Del.) Bunge in Mém. Acad. Petersb. Sér. VII, 4 (1862), no. 11. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 131 no. 917. — Halogeton alopecuroides Moq. Tand. in DC. Prodr. XIII, 2, p. 248. — Boiss. Fl. Or. IV, p. 985. — Salsola alopecuroides Del. Ill. Fl. d'Eg., p. 222 tab. 21. — Anabasis alopecuroides Moq. in DC. Prodr. XIII, 2, p. 215. — Shrubby, glabrous, much

branched, low; branches spreading or curved, slender, white. Leaves scattered, distant, semiterete-club-shaped, flat above, convex below, fleshy, prickly-mucronate or muticous. Axils fleecy; flowers forming globular clusters in the axils, intermixed with orbicular-ovate bracts; flowering sepals hyaline, eroded-denticulate, in fruit the anterior and posterior, or three, or all, furnished with an ovate-fan-shaped wing above the middle, the wings usually unequal; stamens and staminodes 5. — Flow. March to June.

D. l. Abu-Roash; Pyramids of Gîza, in sandy fields abundantly; Pyramids of Zawiyet-el-^cAryan; Saqqâra. — **D. i.** Makhsama. — **D. a. sept.** Wady Dugla; Wady Hof; Wady Rished; abundant in the Galala; Wady Azhar; Wady Hamâta; upper part of the Wady Warâq.

Local name: hamd; damrân; sha'arân (Schweinfurth).

Also known from Syria and Arabia Petraea.

157. (22.) **Halogeton** C. A. Mey.

Flowers by abortion polygamous, clustered in the axils, stipitate in dense wool, the middle one bractless, the outer two with 2—3 bracteoles. Leaves of the perianth five, nearly free, all winged or gibbous at the back. Staminodes 4—5, connate with the filaments. Stamens 5, rarely 3 or 2, anthers with a short appendage or 0. Ovary ovate, style short, stigmas 2, filiform. Radicle superior. — Shrubs or annual herbs, with fleshy leaves.

A small genus of only 5 species in Spain, North Africa, West and Central Asia.

383. **Halogeton sativus** Moq. Tand. in DC. Prodrôm. XIII, 2 (1849), p. 158. — Herbaceous, glabrous, 15—30 cm high, branching from the base; branches erect or ascendent, bullate-papillous. Leaves 2—8 mm long, patulous or deflexed, alternate, terete, oblong-linear, produced into a spine, succulent, farinoso-glaucous. Flowers in the axils solitary or sometimes clustered, wings patulus-erect, obovate-rotundate, flabellato-striate, often rose-purple-coloured. — Flow. January.

D. i. Tell-el-Kebîr (Muschler).

Also known from Spain, Algeria, West and Central Asia.

27. **Amarantaceae.**

Herbs or rarely shrubs. Leaves opposite or alternate, simple and entire, exstipulate. Flowers bisexual or unisexual, usually

regular, generally arranged in spikes or cymes or clusters, each flower seated within 2 scarious bracteoles and subtended by a larger scarious bract. Perianth inferior, persistent, rigid and scarious, often coloured, of 4—5, free or slightly connate segments, imbricate in bud. Stamens hypogynous, 4—5, seldom fewer, opposite to the sepals; filaments free or connate, or united with intervening staminodia into a cup-shaped ring; anthers 1- or 2-celled. Ovary superior, 1-celled; style long or short, simple or divided into 2—3 branches or separate styles; ovules 1 or more, attached to a slender basal funicle. Fruit usually a membranous utricle, rarely a capsule or berry, enclosed or resting upon the persistent perianth. Seeds 1 or more, usually compressed, vertical; albumen farinaceous; embryo annular or curved.

A moderate order, comprising 48 genera and nearly 500 species, most plentiful in tropical or warm countries, absent in colder climates or on the tops of high mountains. Some species of *Amarantus*, *Celosia* (cockscomb) *Gomphrena* are often cultivated in gardens, but as a whole the order is composed of weedy unattractive plants possessing no useful properties. The Egyptian genera are found in all warm countries.

A. Leaves alternate.

I. Flowers glabrous; no staminodes 1. **Amarantus**.

II. Flowers densely wooly; staminodes present 2. **Aerva**.

B. Leaves opposite.

I. Anthers 2-celled; flowers solitary 3. **Achyranthes**.

II. Anthers 1-celled; flowers in dense spikes 4. **Alternanthera**.

158. (1.) **Amarantus** Linn.

Flowers polygamo-dioecious: the central flower of a cluster often perfect, the lateral reduced, sometimes male or obsolete, never spinescent. Perianth of the perfect flower 5- or 3-fid, or 3-fid with sometimes 2 smaller interior segments added (as shown by Schinz for one species). Stamens 5, 3, or fewer; filaments linear, nearly free, without interjeeted rudiments; anthers 2-celled, shortly oblong; pollen small, globose, irregularly tubercled. Ovary ellipsoid: ovule 1, on a basal funicle; style short, with 2—3 short linear branches. Fruit mostly membranous, more or less definitely a pyxis, sometimes indehiscent; seed globose, compressed; embryo annular. — Annuals. Leaves alternate, simple, entire; long-petioled, tip often obtuse or emarginate, mostly glabrous; principal nerves parallel, straight, often conspicuous. Flowers in clusters, arranged in dense heads or long (loose or dense) spikes; bract 1: bracteoles 2, in many species overlapping the flower, in some species shorter than it.

Species 25; common weeds in all the warmer parts of the world.

A. Spikes linear, paniced at the ends of the branches; some shorter axillary spikes sometimes added.

I. Perianth-segments 2,5 mm long, overtopping the fruits.

a) Perianth-segments 5; axillary spikes rare.

1. Leaves lanceolate 1. *A. hypochondriacus*.

2. Leaves ovate to ovate-oblong.

α) Spikes erect, the terminal long 2. *A. paniculatus*.

β) Spikes pendulous, the terminal very long 3. *A. caudatus*.

b) Perianth-segments 3; axillary spikes frequent 4. *A. tricolor*.

II. Perianth-segments 1,5 mm long, about as long as the fruits.

a) Fruit a pyxis 5. *A. patulus*.

b) Fruit wrinkled, herbaceous, indehiscent 6. *A. viridis*.

B. Spikes axillary, running into a single oblong dense spike 7. *A. oleraceus*.

C. Spikes all axillary, short.

I. Perianth-segments long-lanceolate, overtopping the fruits.

a) Stamens and sepals 5.

1. Leaves glabrous 8. *A. hybridus*.

2. Leaves scabrous 9. *A. chlorostachys*.

b) Stamens and sepals 3.

1. Leaves rhombic-ovate, obtuse 10. *A. graecizans*.

2. Leaves obovate, attenuate at the base 11. *A. albus*.

II. Perianth-segments suddenly acute, hardly as long as the fruit.

a) Decumbent, much branched . . 12. *A. Blitum*.

b) Branches elongate 13. *A. polygamus*.

384. (1.) **Amarantus hypochondriacus** L. Spec. Plant. I (1753), p. 1407. — Boiss. Fl. Or. IV, p. 988. — Sickenberg. Contrib. Fl. d'Eg., p. 272. — Annual; 30 to 80 cm high; glabrous or scabridulous, erect. Leaves long-petioled, oblong-lanceolate or lanceolate, cuneate, acuminate. Spikes of the panicle erect, cylindrical, obtuse,

the terminal longer; bracts long-aristate, longer than the deep-purple sepals; utricle 2—3-cleft at the tip. — Flor. March to May.

N. d. As a weed in the gardens of Alexandria and Cairo.

Originally from North America.

385. (2.) **Amarantus paniculatus** L. Spec. Plant. I (1753), p. 1406. — Boiss. Fl. Or. IV, p. 989. — Aschers.-Schweinf. Ill. Fl. d'Eg. Suppl., p. 772. — Sickenberg. Contrib. Fl. d'Eg., p. 272. — Moq. in DC. Prodrum. XIII, 2, p. 257. — Annual; 30 to 60 cm high. scabridulous, erect. Leaves oblong-ovate, tapering at the both ends. Spikes of the panicle erect, cylindrical, acutish, slender, the terminal one longer; bracts aristate, longer than the purple, rarely pallid sepals; utricle 2—3-toothed at the apex. — Flow. March to April.

N. d. Shubra, as a weed in cotton-fields; Khubba (Sickenberg.).

Originally from North America.

386. (3.) **Amarantus caudatus** L. Spec. Plant. I (1753), p. 990. — ed. 2, p. 1406. — Moq. in DC. Prodrum. XIII, 2, p. 255. — Boiss. Fl. Or. IV, p. 988. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 32 no. 918. — Sickenberg. Contrib. Fl. d'Eg., p. 272. — *Amarantus alopecurus* and *A. sanguineus* A. Braun & Bouché in Ind. Sem. Hort. Berol. (1872) Append. 1—2. — An erect annual, 90 cm high. Leaf-blade narrow-elliptic, 12—15 cm long, sometimes a foot long. Spikes numerous (often 20, sometimes 80), 2—8 cm long, dense, in a dense terminal panicle (the terminal spike often 12 cm long) yellowish, usually becoming brown in fruit. Perianth 15 mm long, of 5 oblong scarcely acute segments, many with a short subterminal mucro; bracts (many of them) long-cuspidate, overtopping the perianth. Capsule membranous, ultimately circumscissile; style-branches (usually 3) very long; seeds yellow with a rounded margin, or black with a compressed margin. — Flor. January to March.

N. d. N. v. Naturalized everywhere in the gardens.

Local name: 'Orf-ed-dik.

Cultivated throughout all warm parts of Africa, as is *Amarantus paniculatus* throughout India. In accordance with the canon of Darwin, the nut, being the part economically used, is the part of the plant that varies; see the excellent account by Hook. fil. in Flora of Brit. Ind. IV, p. 719.

387. (4.) **Amarantus tricolor** L. Spec. Plant. I (1753), p. 989. — ed. II, p. 1403. — *Amarantus gangeticus* Linn. Syst. Nat. ed. 10, p. 1268. — Spec. Plant. ed. 2, p. 1403. — Moq. in DC. Prodrum. XIII, 2, p. 261. — Boiss. Fl. Or. IV, p. 990 pro parte. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 132 no. 921. — Sickenberg. Contrib. Fl. d'Eg., p. 272. — An erect annual, 30—150 cm high. Leaf-blade

spathulate-ovate, acuminate, often 4 cm long; petioles 2—3½ cm long. Spikes numerous, the terminal one long-cylindric, often with several penultimate forming a panicle; nearly always axillary spikes, even in the lower axils, are added. Perianth 1.5 cm long; segments 3, lanceolate, acuminate, mucronate; bracts long-awned, equalling or overtopping the perianth. Capsule membranous, ultimately circumscissile; style branches usually 3. — Flor. March to April.

M. ma. Alexandria (Pfund.). — **N. d.** Shubra; Kasr-el-Aïn. — **N. v.** Aswân.

In India, cultivated and a weed. — Boiss. Fl. Or. IV, p. 990 says that he found, in his specimens of *Amarantus gangeticus* from India, the perianth-segments always 5. From this it would appear that his specimens were some forme of *Amarantus caudatus*.

388. (5.) **Amarantus patulus** Bertol. Comm. de itin. neapol. (1837), p. 19 tab. 2. — Boiss. Fl. Or. IV, p. 989. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 132 no. 920. — Stems 30 to 90 cm long and more, purple less erect and more branched than in *A. caudatus*. Leaves glaucous 3—6½ cm long, ovate, narrowed upwards; no spines in the axils. Spikes cylindric, about 1 cm broad, the upper long, often closely paniced, the terminal often 6—8 cm long; in the lower axils globose spikes are often added. Bracts ovate, cuspidate, about as long as the perianth, or frequently shorter than it. Segments of the perianth 5, broadly oblong, obtuse, scarcely mucronate. Capsule thin (the seed escaping), more or less distinctly circumscissile. — Flow. March to June.

N. d. Cairo (Gaillardot).

A native of the Southern United States, now spread in the Mediterranean region, with the Cape Verde Islands and the Canaries.

389. (6.) **Amarantus viridis** L. Spec. Plant. II (1762), p. 1405. — *Albersia caudata* Boiss. Fl. Or. IV, p. 992. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 132 no. 925. — *Euxolus caudatus* Hook. Niger Flor., p. 492. — Moquin in DC. Prodr. XIII, 2, p. 274 partly. — *Chenopodium caudatum* Jacq. Icon. Plant. Rar., tab. 344. — Suberect, 30 to 90 cm high. Leaves long-petioled; blade 2.5—7 cm long, ovate or elliptic. Spikes linear, the terminal 4—9 cm long, paniced towards the ends of the branches, much looser than in the allied species, the pedicels visible. Perianth 1.5 mm long; segments 3, elliptic, acute. Fruit as long as the perianth, indehiscent, wrinkled, shrinking on the nut, herbaceous, not membranous, with no trace of a transverse line. — Flow. March to June.

N. d. Gezire; island of Rôda; Cairo, in the garden of Qasr-el-'Ain (Schweinfurth). — **N. v. mer.** Near Thebes (v. Samson).

Local name: gabbes.

Widely distributed in warm countries — a weed. — This species is easily recognized by the small pedicellate flowers in panicle long spikes; also by the absolutely indehiscent herbaceous fruits. Jacquin (l. c.) shows the perianth-segments 5, equal; which, so far as known, does not occur in this species. Either, therefore, the synonymy of Moquin and others founded on it falls to the ground, or an error must be assumed in the plate.

390. (7.) **Amarantus oleraceus** Linn. Spec. Plant. II (1762), p. 1403. — Boiss. Fl. Or. IV, p. 991. — Forsk. Flor. aeg.-arab., p. CXXI. — *Amarantus Blitum* var. *oleracea* Hook. fil. Flor. Brit. Ind. IV, p. 721. — *Euxolus viridis* Moq. in DC. Prodr. XIII, 2, p. 273. — *Albersia oleracea* Kunth Fl. Berol. II, p. 114. — Sickenberg. Contrib. Fl. d'Eg., p. 272. — Inflorescence copiously axillary, the terminal running into a dense cylindric leafless mass; otherwise as *Amarantus polygamus* L. — Flow. April.

M. ma. Alexandria (D. Pfund.).

Widely distributed in all warm countries as a weed.

391. (8.) **Amarantus hybridus** L. Spec. Plant. II (1762), p. 1406. — Aschers.-Schweinf. Supplem. III. Fl. d'Eg., p. 772 no. 1314. — Sickenberg. Contrib. Fl. d'Eg., p. 272. — Moq. in DC. Prodr. XIII, 2, p. 259. — Stems erect, angulate, striate, glabrous, greenish. Leaves petiolate, ovate-oblong or ovate, acute, glabrous; panicles loosely branched; spikes erect, cylindric, obtuse, the terminal one very long, rigid, the lateral smaller, narrowed; flowers greenish-coloured, the sepals shorter than the bracts; utricle as long as the calyx, 2—3-fid at the tip, subrugose. — Flow. November.

N. d. Shubra; Cairo, everywhere as a weed in gardens.

A widely distributed weed in all warm countries.

392. (9.) **Amarantus chlorostachys** Willd. Amarant. (1790), p. 34 no. 26 tab. 10 fig. 19. — Boiss. Fl. Or. IV, p. 988. — Aschers.-Schweinf. III. Fl. d'Eg., p. 132 no. 919. — Sickenberg. Contrib. Fl. d'Eg., p. 272. — Moq. in DC. Prodr. XIII, 2, p. 259. — Stems erect, striate-sulcate, pubescent or scabrous, greenish. Leaves long-petioled, deltoid-ovate or ovate, obtuse or sometimes subacute, scabrous, greenish-coloured; panicles branched; spikes ascendent, cylindrical, acute, the terminal long, subflexuous, the lateral shorter, narrowed. Flowers greenish-coloured, sepals as long as the bract or shorter; utricle longer than the calyx, 2—3-dentate at the tip, rugose. — Flow. March to April.

M. ma. Alexandria, naturalized. — **N. d.** Cairo, often as a weed in the old arabic gardens.

As a weed in all warm countries.

393. (10.) **Amarantus graecizans** L. Spec. Plant. I (1753), p. 990. — ed. II, p. 1405. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 132 no. 922. — Boiss. Fl. Or. IV, p. 990. — *Amarantus sylvestris* Desf. Cat. Hort. Paris., p. 41. — *Amarantus Thunbergii* Moq. in DC. Prodrum. XIII, 2, p. 262. — *Amarantus Blitum* var. *d. graecizans* Moq. in DC. Prodrum. XIII, 2, p. 263. — Decumbent or spreading; branches 31—62 cm long. Leaves long-petioled; blade 2—4 cm long, elliptic, narrowed at either end. Spikes globose, copious, axillary, the uppermost running sometimes into a single terminal oblong inflorescence 1—1½ cm long. Perianth-segments 3 (2 inner rather narrower added in the well-developed bisexual flowers), broadly elliptic, subobtusate, with a long filiform recurved tail, about 1.5 mm long, exclusive of the tail. Bracts elongate, lanceolate, mucronate, as long as the perianth-segments, including their tails. Capsule thin, circumscissile. — Flow. March to April.

M. ma. In sandy places common: Almaïda; Alexandria-West and -East; Mandara; Abukîr. — **N. d.** Rosetta; Fua; Esne; Benha-el-Asl; Damanhûr; Er-Rahmânîya; Mehallet-el-Kebîr; Mansûra; Tanta; Cairo, everywhere. — **N. f.** Medînet-el-Fayûm; Begîg; Fidemîn; Kafr Mukfût; Tamîa; El-Hammâm. — **N. v.** Beni-Suêf; Feshn; Melatiya; Minia; Monfalût; Siut; Ekhmin; Kene; Aswân. — **O.** Oasis Siwa, not rare; Little Oasis in great abundance; Dakhel; Great Oasis. — **D. a. mer.** Suez; Qoseyr; Wady Gadîre.

Local name: fiss-el-kilâb (Forskâl); fiss-el-kelb (Schweinfurth; Muschler); shegeret-es-santîn (Mohammed).

All parts of warmer countries.

var. **angustifolia** (Marsch. Bieb.) Aschers. and Schweinf. Ill. Fl. d'Eg. (1887), p. 132 no. 922. — *Amarantus sylvestris* var. *graecizans* Boiss. Fl. Or. IV, p. 990. — Moq. in DC. Prodrum. XIII, 2, p. 263. — Leaves smaller than in the type. — Flow. March.

N. d. Damanhûr; Zifta; Zaqaziq; Benha-el-Asal; Mutshtahir; Qalyûb; Cairo. — **N. v.** Cairo; Kafr Amar; Beni-Suêf; Feshn; Maghâgha; Beni Hassan; Luksor; Erment. — **D. a. mer.** Qoseyr; Wady Etit.

Local name: fiss-el-kelb.

Distributed like the type.

394. (11.) **Amarantus albus** L. Spec. Plant. II (1762), p. 1404. — Boiss. Fl. Or. IV, p. 990. — Aschers.-Schweinf. Supplem. Ill. Fl.

d'Eg., p. 772 no. 1315. — Sickenberg. Contrib. Fl. d'Eg., p. 272. — Moq. in DC. Prodrum. XIII, 2, p. 264. — Stem erect or ascendent, subangulate, glabrous, white. Leaves long petioled, ovate or rhomboid-ovate or obovate, obtuse, emarginate, glabrous, greenish. Flower-clusters shorter than the petioles, subovate; flowers narrowed greenish-coloured; calyx much shorter than the bracts; utricle twice as long as the calyx, 2—3-dentate at the tip, rugose. — Flow. January to March.

N. v. Cairo, weed in all gardens.

Widely distributed throughout all warm countries — a weed.

395. (12.) **Amarantus Blitum** L. Spec. Plant. I (1753), p. 990. — ed. II, p. 1045. — Forsk. Flor. aeg.-arab. CXXI. — Moq. in DC. Prodrum. XIII, 2, p. 263 partly. — *Amarantus sylvestris* Zarb in Cat. Spéc. Bot. Pfund., p. 33. — *Albersia Blitum* Kunth Flor. Berol. II, p. 144. — Boiss. Fl. Or. IV, p. 991. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 132 no. 924. — A glabrous, much-branched, small annual, decumbent or erect, rarely more than 35 cm high. Leaves (including the petiole) usually small, 1—1½ (rarely 4) cm long, varying from narrow-oblong to obovate. Inflorescence copious, entirely axillary. Perianth hardly 1.5 mm long, shorter than the fruit; segments 3, elliptic or lanceolate. Fruit small, 0.75—1.5 mm long, ovoid; sometimes succulent, indehiscent; sometimes thin, the seed escaping, more or less obscurely circumscissile. — Flow. January to April.

N. d. Everywhere in gardens, as a weed.

In all warm countries.

396. (13.) **Amarantus polygamus** L. Amoen. Acad. IV (1756), p. 294. — Spec. Plant. II, p. 1403. — *Euxolus polygamus* Moq. in DC. Prodrum. XIII, 2, p. 272. — *Albersia polygama* Aschers. in Schweinf. Beitræg. Flor. Aethiop., p. 175. — Boiss. Fl. Or. IV, p. 991. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 132 no. 923. — *Albersia polygonoides* Zarb. in Cat. Spéc. Bot. Pfund., p. 33. — *Amblyogyne polygonoides* Rafin. ex Aschers.-Schweinf. Ill. Fl. d'Eg., p. 133 no. 926. — Sickenberg. Contrib. Fl. d'Eg., p. 272. — Suberect, stouter, up to 75 cm high, with long branches. Leaves variable in size; petioles often very long; blade 3 cm long by 1 cm broad, ovate elliptic. Inflorescence wholly axillary, not running into a leafless terminal spicate mass.; otherwise as *Amarantus Blitum*. — Flow. January to March.

N. v. Cairo, in the Garden of Qasr-el-'Ain.

Widely distributed in all warm regions.

Bastard.

396 a. **Amarantus Artineanus** Muschler hybrid. nov. (385 \times 392. — Sickenberg. Contrib. Flor. d'Eg., p. 272. — *Amarantus paniculatus* \times *Amarantus chlorostachys*). — An erect annual herb, up to 50 cm high; scabrous. Leaves ovate or rhombic-ovate, tapering at both ends; spikes of the panicle erect, cylindrical, acutish, slender. Flowers greenish-coloured, bracts as long as the sepals; utricle longer than the calyx; 2—3-toothed at the tip. — Flow. March.

N. d. Shubra (Sickenberg. in Herb. Schinz).

Hence only known from Egypt.

159. (2.) Aerva Forsk.

Flowers polygamous, monoecious or subdioecious, in dense cylindric or ovoid spikes. Bracts and perianth white or tawny, thin, often pointed, but very soft, not spinous. Perianth usually of 5 segments, with much fine soft hair. Stamens 5; filaments linear, on the staminal tube, with 5 interposed staminodes; anthers 2-celled. Ovary ovoid, with 1 ovule on a basal funicle; style shorter than the ovary, branches 2, oblong or very short. Utricle thin; seed ovoid, flattened; embryo annular. — Herbs or small shrubs, hairy. Leaves alternate, entire, flat. Spikes axillary, or running into terminal leafless panicles.

A small genus of about 10 species in all the warmer parts of Asia and Africa.

397. **Aerva tomentosa** Forsk. Flor. aeg.-arab. (1775), p. CXXII and 170. — *Aerva aegyptiaca* Gmel. Syst. Nat., p. 1026. — *Aerva incana* Mart. in Nov. Act. Nat. Cur. XIII (1826), p. 291. — *Aerva javanica* Wight Icon. Plant. Or., tab. 876. — Moq. in DC. Prodrum. XIII, 2, p. 299 partly. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 133 no. 917. — Boiss. Fl. Or. IV, p. 992. — Sickenberg. Contrib. Fl. d'Eg., p. 272. — *Iresine persica* Burm. Flor. Ind., p. 212 tab. 65 fig. 1. — Stem suberect, 60 cm to 1,20 cm high, branched, tomentose with stellate and branched hairs. Leaves alternate, 12 cm long, 1 cm broad, wooly when young, often in age glabrate. Spikes of flowers cylindric, 4 cm long, 12 mm broad, dense collected in terminal leafless panicles. Flowers 3,1 mm long. Bracts and perianth-segments triangular at the tip, hardly mucronate, very soft; hairs of numerous short cells, minutely papillose. Style-branches oblong, sometimes nearly as long as the style. — Flow. October to February and March.

M. p. El-'Arish. — **O.** Siwa, very abundantly; Little Oasis, on calcareous ground; Farâfra; Dakhel; Great Oasis. — **D. i.** Es-

Sâlihîya, in sandy places rare, abundantly on calcareous ground. — **D. a. sept.** Moqattam; Gebel ahmar; Wady Dugla; Galala, everywhere; Wady Warâq; Serapeum; Suez. — **D. a. mer.** Aswân; Wady Mbâarak; Wady Gadîre; Qoseyr.

Local name: shegeret-en-na'guch (Forsk.); yerrûg (Bové.); yarra; yerra (Schimper); 'ar'a (Klunzinger, Schweinfurth); gheyl (Schweinfurth, Muschler); turf (Calvert.); ta'asîna (Ascherson).

Extending into Tropical Africa and through North Africa, the Orient to the North and West of India.

var. **Bovei** (Webb) C. B. Carke in Flor. Trop. Afr. VI, 1 (1909), p. 38. — *Aerva javanica* var. *Bovei* Webb in Hook. Niger Flora, p. 173. — Moq. in DC. Prodr. XIII, 2, p. 300. — Boiss. Fl. Or. IV, p. 993. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 133 no. 927. — Sickenberg. Contrib. Fl. d'Eg., p. 272. — A smaller, burnt-up form; leaves about 2.5 cm long, often less, oblong or obovate, sometimes recurved; flowers smaller, spikes much more slender and often much interrupted. — Flow. October to March.

D. a. sept. Wady Dugla. — **D. a. mer.** Aswân; Qoseyr; Mirsa Wady Lekhuma.

Also known from Tropical Africa.

Forskâl gives the full name of this species on page CXXII, and an excellent description on page 170. Jussieu (in Ann. Mus. Par. II 1803, 131) mentions "javanicum" as a species he would transfer to *Aerva*; and, by tracing back, it is found that he meant *Iresine javanica*, Burm. (Fl. Ind. t. 65, fig. 2). It is evident, from Burmann's figures, that *A. tomentosa* Forsk., is *Iresine persica* Burm., which does not extend so far east as the Malay Peninsula and Java. If, therefore, either of Burmann's names is to be taken, it will be *persica* (as has been done by O. Kuntze and Hiern); but *A. tomentosa*, Forsk., is not only the older name, but expresses the one characteristic on which the species stands (cf. Baker and Clarke in Fl. Trop. Africa VI, 1, p. 38).

160. (3.) *Achyranthes* Linn.

Flowers perfect, solitary, i. e. without sterile flowers or rudimentary bracts, each between 2 bracteoles, usually acute or spinescent. Perianth-segments 6 mm long or more, oblong, mucicous or mucronate, glabrous (except in *A. lanuginosa*). Filaments 5, linear to the base; the interposed staminodes quadrate, usually fimbriate at the top; anther-cells 2, oblong. Ovary ovoid or obovoid, glabrous or minutely granular-papillose at the top; style linear; stigma small, capitate; ovule 1, on a basal funicle. Utricle obovoid; seed ellipsoid; embryo curved. Perianth in fruit deflexed, close to the rhachis,

pointed vertically downwards. — Leaves opposite, petioled. Spikes linear-cylindric, in fruit often a foot long and interrupted at the base.

Species 6, in the warm parts of the Old World. *A. aspera* Linn., is a weed, wide-spread, and various subspecies have been varved out of it.

398. **Achyranthes aspera** L. Spec. Plant. I (1753), p. 204. — ed. II, p. 295. — Boiss. Fl. Or. IV, p. 993. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 133 no. 928. — Moq. in DC. Prodrum. XIII, 2, p. 314. — Loprior. in Engler's Bot. Jahrb. XXX, p. 12 tab. 1 fig. G. J. — An erect hairy herb, 30—120 cm high. Leaves opposite, petioled; blade 2—3 cm long, elliptic, narrowed at either end. Spikes in flower 4—8 cm long, dense; in fruit usually much elongated, up to 12—38 cm long, with the lower flowers distant. Perianth 1—2 cm long; segments lanceolate, mucronate, glabrous; bracteoles $\frac{1}{2}$ or $\frac{2}{3}$ the length of the perianth, appearing as simple spines, really springing from a small quadrate or emarginate base. Stamínodes quadrate, fimbriate. Ovary obovoid, the top depressed hemispherical granular-tubercular. Perianth in fruit rigidly deflexed close to the rhachis, becoming very hard. — Flow. March to April.

N. d. Cairo, gardens of Prince Hussein (Muschler); naturalized.

An abundant weed in the hotter parts of the Old World.

var. **sicula** L. Spec. Plant. I (1753), p. 204. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 133 no. 928. — *Achyranthes aspera* var. *argentea* Boiss. Fl. Or. IV, p. 994. — *Achyranthes argentea* Lam. Eucycl. I, p. 545. — Moq. in DC. Prodrum. XIII, 2, p. 315. — Zarb in Cat. Spéc. Bot. Pfund, p. 33. — Leaves silky strigose beneath with white hairs, often silvery; perianth frequently smaller than in the type. — Flow. March.

N. d. Rosetta; Damietta. — **D. a. mer.** Qoseyr.

An abundant weed in the hotter parts of the Old World.

161. (4.) **Alternanthera** Forsk.

Flowers perfect, solitary, each (without sterile flowers or rudimentary bracts) supported by 2 bracteoles. Perianth thin; segments elliptic, lanceolate or mucronate, nearly glabrate or minutely hairy. Filaments linear to the base; staminodes interjected, often very small; anthers 1-celled. Ovary obovoid, truncate; ovule 1, on a basal funicle; style very short, subsetaceous. Utricle much flattened, broadly obovoid, with a notch at the top in which remains the small style, winged with thin margins; seed lenticular; embryo curved. — Leaves opposite. Spikes small, globose or ovoid, axillary. Perianths in fruit stellate.

Species 25, in the warm parts of both hemispheres.

- A. Leaves oblong or elliptic, narrowed towards the top.
- I. Perianth-segments $\frac{1}{6}$ in. long, mucronate or very acute. 1. *A. nodiflora*.
- II. Perianth-segments 2—2,5 mm long, not very acute 2. *A. achyranthoides*.
- B. Leaves obovate, not narrowed towards the top 3. *A. echinata*.

399. (1.) **Alternanthera nodiflora** R. Br. Prodröm. (1810), p. 417. — Moq. in DC. Prodröm. XIII, 2, p. 356. — Sickenberg. Contrib. Fl. d'Eg., p. 273. — Rootstock often woody. Branches several, procumbent, pubescent or hairy towards the top, 12—50 cm long. Leaves 1—5 cm long, oblong or elliptic-lanceolate, narrowed at either end, hardly petioled, glabrate or obscurely hairy. Spikes solitary or clustered in the axils, 6—30 mm diam., white, apparently glabrate. Perianth-segments $\frac{1}{6}$ cm long, elliptic-lanceolate, acuminate, acute or mucronate, glabrate or with a few very thin simple hairs scattered near the base and on the margins. Staminal tube a short broad cup; staminodes reduced to minute notched teeth. — Flow. March.

N. d. Matariye near Cairo.

Also known from Tropical Africa, India, Malaya and Australia.

400. (2.) **Alternanthera achyranthoides** Forsk. Flor. aeg.-arab. (1775), p. LIX, and p. 28. — *Alternanthera sessilis* R. Br. Prodröm., p. 417. — Moq. in DC. Prodröm. XIII, 2, p. 357. — Boiss. Fl. Or. IV, p. 996. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 133 no. 929. — Sickenberg. Contrib. Fl. d'Eg., p. 273. — *Alternanthera denticulata* R. Br. Prodröm., p. 417. — Moq. in DC. Prodröm. XIII, 2, p. 356. — Rootstock often woody. Branches several, procumbent, pubescent or hairy towards the top, 12—50 cm long. Leaves 1—5 cm long, oblong or elliptic-lanceolate, narrowed at either end, hardly petioled, glabrate or obscurely hairy. Spikes solitary or clustered in the axils, 6—12 mm diameter, white, apparently glabrate. Perianth-segments 1—1,5 mm long, not mucronate, often triangular at the top. Staminal tube a short broad cup; staminodes reduced to minute notched teeth. — Flow. October to February.

N. d. Rosetta (Forskål, Schweinfurth). — *Damietta* (Sieber.).

Local name: namûl.

A weed in Tropical Africa, South Asia and Australia.

401. (3.) **Alternanthera echinata** Smith in Rees Encycl. Suppl. (1810) no. 10. — Moq. in DC. Prodröm. XIII, 2, p. 360.

— *Alternanthera spinosa* Sickenberg. in Contrib. Fl. d'Eg., p. 273 not Roem. Schult. — *Alternanthera Achyrantha* R. Br. Prodröm., p. 417. — Moq. in DC. Prodröm. XIII, 2, p. 358. — Stems procumbent, 1—2 ft. long, branched, hairy. Leaves 1—3 cm long, obovate-spathulate, shortly petioled. Spikes 8 mm long, ovoid or ellipsoid, very pale brown. Perianth-segments 4 mm long, lanceolate, mucronate, almost prickly in fruit, glabrous, but near the base of 3 of them is a dense tuft of small white hairs linear with glochidiate tip. Otherwise as *A. nodiflora*. — Flow. March.

N. d. Samanut.

Also known from Tropical Africa and other warm parts of the Old World.

28. Nyctaginaceae.

Herbs or shrubs or trees. Leaves opposite or less frequently alternate, simple, entire, exstipulate. Flowers bisexual or unisexual, often involucrate, usually arranged in cymose panicles. Perianth inferior, petaloid, monophyllous; tube persistent and enveloping the fruit; limb with 3—5-plicate lobes. Stamens variable in number (1—30), usually 6—10, hypogynous; filaments often unequal, inflexed in bud; anthers didymous. Ovary superior, 1-celled; style simple, terminal, stigma small, entire or multifid; ovule solitary, basilar, erect. Fruit an utricle with a membranous pericarp, firmly enclosed in the thickened or hardened base of the perianth-tube, which falls off with it. Seed erect, with a thin adherent testa; albumen farinaceous or fleshy; embryo with foliaceous cotyledons usually wrapped round the albumen, radicle inferior.

A small order, of no economical importance, with the exception of 2 or 3 wide-ranging genera almost wholly confined to tropical America. Genera 23; species about 200. — *Bougainvillea spectabilis* Willd. is cultivated in all Egyptian gardens.

A. Bracts large, connate 1. **Mirabilis.**

B. Bracts minute, free 2. **Boerhaavia.**

162. (1.) **Mirabilis** Linn.

Involucre calyx-like, 5-lobed, marcescent, 1— ∞ -flowered. Perianth-tube long, constricted above the ovary; limb rather flattened, 5-lobed plicate, deciduous. Stamens 5—6, unequal, exserted; filaments capillary, incurved at the apex, united into a short cup at the base; anther-cells subglobose. Ovary ellipsoid or ovoid; style filiform, exserted; stigma capitellate, bearing stalked papillae. Fruit enclosed in the hardened base of the perianth and surrounded at the base by the persistent staminal cup. Seeds adhering to the

pericarp; embryo curved; cotyledons surrounding the scanty farinaceous endosperm. — Di- or tri-chotomously branched herbs, glabrous or glandular-pubescent; root elongated or tuberous. Leaves opposite, the lower petioled, upper sessile. Involucres cymosely arranged. Flowers rather large, fragrant or inodorous, white, red or variously coloured.

Species about 10, in the hotter parts of America.

402. **Mirabilis Jalapa** L. Spec. Plant. I (1753), p. 177. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 135 no. 949. — Choisy in DC. Prodrum. XIII, 2, p. 427. — *Mirabilis dichotoma* L. Syst. Veg. ed. X vol. II, p. 931. — Spec. Plant. II, p. 252. — An erect perennial herb about 60 cm high. Root napiform. Stem glabrous or shortly pubescent. Leaves thin, ovate or ovate-cordate, acuminate, glabrous or pulverulent above, often ciliate on the margin and bearing cystoliths below, 7 cm long, 3 cm wide; petiole slender, 1.2 cm long. Involucre 1.2 cm long; lobes ovate. Flowers 3—6 in each cyme. Perianth purple, red, yellow or white; tube 4 cm long, cylindrical below, funnel-shaped at the top; limb spreading, 2.5 cm or rather more in diam. — Flow. March.

N. d. Cairo, cultivated in the Arabian gardens; naturalized.

Local name: itmâny (Forskål); shebb-el-leyl (Forsk., Delile); Shâb-el-hyle (Schweinf.).

A native of Peru, now established in many parts of the Old World.

163. (2.) **Boerhaavia** Vail.

Bracts minute, rarely forming an involucre. Perianth-tube cylindrical, the lower part persistent and becoming hardened to enclose the fruit, the upper part petaloid and deciduous; limb shortly 5-lobed. Stamens 1—5, more or less exserted; filaments capillary, connate at the base; anthers 2-celled. Ovary stipitate; style capillary; stigma peltate. Persistent base of the perianth clavate, hard, 5-ribbed, often glandular, enclosing the fruit. Seed adherent to the pericarp; embryo uncinate; cotyledons thin, broad, encircling the thin endosperm; radicle long. — Much-branched herbs. Leaves opposite, entire or slightly repand. Flowers small, usually umbellate; pedicels articulated at the apex.

Species about 20, throughout the tropics and warm temperate regions.

A. Flowers all in terminal umbels 1. **B. repens**.

B. Flowers both in terminal and lateral whorls . . 2. **B. verticillata**.

403. (1.) **Boerhaavia repens** L. Spec. Plant. I (1753), p. 3. — Boiss. Fl. Or, IV, p. 1045. — Aschers.-Schweinf. Ill. Fl. d'Eg.,

p. 135 no. 951. — Sickenberg. Contrib. Fl. d'Eg., p. 273. — Choisy in DC. Prodr. XIII, 2, p. 453 (incl. var. *glabra*). — Delile Ill. Fl. d'Eg., p. 2 tab. 3 fig. 1. — *Boerhaavia vulvarifolia* Poir. Encycl. V, p. 55. — Herbaceous, much-branched. Stems slender, cylindrical, glabrous or nearly so, thickened at the nodes. Leaves in unequal pairs at each node, ovate or lanceolate, acute or obtuse, rounded at the base, slightly undulate, usually glabrous, rarely more than 2 cm long and 19 mm broad. Peduncles axillary, slender, bearing 4—10-flowered umbels; bracts small, lanceolate. Perianth about 2 mm long; tube clavate, 5-ribbed, glandular between the ribs; lobes very short, rounded, pinkish. Stamens 1—3, as long as or slightly longer than the perianth. Stigma peltate. Fruit 5 mm long, enclosed in the strongly 5-ribbed glandular basal part of the perianth. — Flow. March to April.

N. v. Beni Suêf. — **O.** Great Oasis; Dakhel.

Local name: muddeyd (Ascherson).

Also known from Western Asia.

var. **diffusa** Hook. fil. Fl. Brit. Ind. IV (1885), p. 709. — Boiss. Fl. Or. IV, p. 1045. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 135 no. 951. — Sickenberg. Contrib. Fl. d'Eg., p. 273. — *Boerhaavia diffusa* L. Spec. Plant. I, p. 3. — Choisy in DC. Prodr. XIII, 2, p. 452. — *Boerhaavia hirsuta* Willd. Phytogr., p. 1. — Stems usually several from a woody rootstock, glabrous or pubescent. Leaves ovate or ovate-rotundate, obtuse, sinuate, usually about 2.5 cm long and slightly less in breadth, usually pubescent or puberulous on both surfaces, pale green beneath. Inflorescence and flowers as in the type. Fruit 3 cm long, clavate, strongly 5-ribbed, less glandular between the ribs than in the type. — Flow. March to April.

N. d. Gezire; Matariye; Belbeys.

Local name: moudeyd (Schweinf.).

Also known from Tropical Africa and India.

var. **undulata** (Ehrenberg) Aschers. and Schweinfurth in Ill. Fl. d'Eg. (1887), p. 136 no. 951. — Sickenberg. Contrib. Fl. d'Eg., p. 273. — All the leaves undulate at the margin. — Flow. March.

N. v. Environs of Aswân.

Only known Upper Egypt.

404. (2.) **Boerhaavia verticillata** Poir. Encycl. V (1804), p. 56. — Boiss. Fl. Or. IV, p. 1045. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 135 no. 950. — Choisy in DC. Prodr. XIII, 2, p. 454. — *Boerhaavia stellata* Wight Icon. Plant. Orient, tab. 875. — Stems tall, much branched, diffuse, glabrous. Leaves distinctly petioled, broadly

ovate, acute or obtuse, 4 cm long, $2\frac{1}{2}$ cm wide, entire or slightly repand. Flowers in a lax panicle of distant 3—5-flowered whorls above the leaves; pedicels very short; bracts very minute. Upper part of the perianth broadly funnel-shaped, 2 mm long, shallowly lobed; accrescent base clavate, 4 mm long, with large globose stalked glands around the apex. Stamens 2, slightly exserted. — Flow. March to June.

D. a. mer. Wâdy Gadire (Schweinfurth).

Also known from Tropical Africa and Asia.

29. Phytolaccaceae.

Flowers hermaphrodite or unisexual. Perianth inferior, herbaceous or coriaceous, rarely coloured, 4—5-partite, regular or nearly so; segments equal or unequal, imbricate. Stamens 4—5 or many, usually inserted on a hypogynous disk; filaments subulate, sometimes connate at the base; anther-cells parallel, dehiscing longitudinally. Ovary superior; carpels one or many, concrete or distinct; style none or short; stigmas as many as the carpels, linear or capitate; ovules solitary, basal, with a short funicle. Fruit of one or many carpels, fleshy or dry. Seed erect, compressed; testa membranous or crustaceous; embryo peripheric, enclosing the albumen; cotyledons foliaceous or subcylindrical; radicle long. — Shrubs or herbs, rarely trees. Leaves alternate, entire; stipules none or small. Flowers usually racemose, green or whitish, small.

Species about 60, concentrated in tropical America.

- | | |
|-------------------------------|-----------------------|
| A. Leaves alternate | 1. Phytolacca. |
| B. Leaves opposite | 2. Giesekia. |

164. (1.) **Phytolacca** Linn.

Flowers hermaphrodite or dioecious. Perianth green or slightly coloured, 5-partite; segments equal, oblong, obtuse, spreading or reflexing at a late stage. Stamens 5—25, inserted at the base of the perianth, rudimentary in the female flowers; filaments subulate, sometimes connate at the base; anthers oblong, incumbent. Ovary globose; carpels 6—12, free or more or less connate; styles as many as the carpels; ovules solitary, basal, campylotropous. Fruit depressed-globose, fleshy; carpels free or connate. Seeds reniform, compressed, beaked or obtuse at the base; testa black, crustaceous, shining; embryo annular, enclosing the endosperm; cotyledons semiterete; radicle long. — Herbs or shrubs, rarely trees, erect or scandent. Leaves alternate, entire, petiolate. Flowers in dense racemes; pedicels bracteate and bibracteolate.

Species about 10, chiefly natives of America.

405. **Phytolacca americana** L. Spec. Plant. I (1753), p. 441. — *Phytolacca decandra* L. Spec. Plant. II (1762), p. 631. — Boiss. Fl. Or. IV, p. 895. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 125 no. 864. — Walter, Phytolacc. in Engler Pflanzenr. IV, 83, p. 52. — Perennial 1 m high or more, glabrous; stem usually purplish. Leaves ovate to oblong-lanceolate, cuneate at the base, short-petioled. Flowers bisexual; racemes or peduncles longer than the petioles, 10—15 cm long; stamens 10; berry 10-ribbed and 10-carpelled. — Flow. January to April.

N. d. N. v. Cultivated and sometimes naturalized in the gardens of Cairo.

Local name: sabbâgha.

Originally in the United States of North America.

165. (2.) **Giesekia** Linn.

Flowers bisexual. Perianth green or slightly coloured, 5-partite; segments equal, oblong, spreading or reflexing at a late stage, membranous at margins. Stamens 5—12, filaments subulate at the base; anthers oblong, incumbent. Ovary globose; carpels 5 or 3—4, ovules solitary, basal, campylotropous; style recurved at the tip. Fruit depressed-globose, fleshy; carpels free. Seeds crustaceous, beaked or obtuse at the base; embryo annular, enclosing the endosperm; cotyledons semiterete; radicle long. — Herbs or shrubs, erect or scandent. Leaves opposite, entire, petiolate.

A small genus of only 5 species in Tropical Africa and India.

406. **Giesekia pharnaceoides** L. Mant. II App. (1764), p. 562. — Boiss. Fl. Or. IV, p. 896. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 125 no. 865. — *Pharnaceum occultum* Forsk. Flor. aeg.-arab., p. 58. — Annual, glaucous, branching from the base, often procumbent. Leaves short-petiolate, elliptical or elliptical-lanceolate, obtuse. Cymes 10—20-flowered; pedicels as long as the minute flowers or a little longer; perianth-lobes ovate, concave, acute; stamens 5; carpels ovate-sphaerical, subcompressed. — Flow. April.

D. a. mer. Sherm Luliya; Gebel Ferrâye.

Also known from Western Asia.

30. **Aizoaceae.**

Annual or perennial herbs, rarely undershrubs, of very various habit. Leaves opposite or alternate or whorled, simple, often fleshy, stipules wanting or scarious. Flowers regular, usually bisexual, solitary or fascicled or cymose. Calyx free or adnate to the ovary,

4—5-celled or partite, imbricate. Petals either narrow and numerous, or 4—5 and small, or altogether wanting. Stamens perigynous or rarely hypogynous, few or many; filaments free or connate at the base. Ovary superior or inferior, 1—5-celled; styles as many as the cells, free or united at the base; ovules either solitary in the cells and basal, or numerous and axile. Fruit generally a capsule with loculicidal or transverse dehiscence, more rarely drupaceous or separating into 1-seeded cocci. Seeds solitary or many, usually compressed; albumen scanty or copious; embryo slender, curved round the albumen, terete.

A large order, comprising 20 genera and nearly 500 species, mostly tropical or sub-tropical, and especially plentiful in South Africa; rare or absent in cold climates. The properties of the order are important. Many species of *Mesembrianthemum* have showy flowers, and are cultivated in gardens; and *Tetragonia* is occasionally used as a pot herb. The remaining genera are mostly insignificant weeds. The Egyptian genera are widely distributed, although much more numerous in South Africa than elsewhere.

A. Ovary inferior.

I. Petals ∞ . Capsule loculicidal. 1. *Mesembrianthemum*.

II. Petals 0. Fruit indehiscent, a nut or drupaceous 2. *Tetragonia*.

B. Ovary superior.

I. Calyx gamosepalous.

a) Dehiscence loculicidal 3. *Trianthema*.

b) Dehiscence circumsciss 4. *Aizoon*.

II. Calyx chorisepalous.

a) Leaves alternate 5. *Telephium*.

b) Leaves radical, rosulate, or caulm
ones pseudo-verticillate 6. *Mollugo*.

166. (1.) *Mesembrianthemum* Linn.

Calyx-tube adnate to the ovary: limb 5-(1—8-)lobed, usually unequal. Petals ∞ , linear, inserted in the calyx-tube. Stamens ∞ , multiseriate. Ovary inferior 5-(4—20-)celled; styles as many as cells, longitudinally stigmatose; ovules ∞ . Capsule dehiscing loculicidally at the apex; seeds minute. — Herbs or frutescent, erect or procumbent, leafy, fleshy. Leaves usually opposite, simple, thick and fleshy, very various in form; exstipulate. Flowers conspicuous, white, yellow or rose.

A large genus, principally South African, with a few scattered members in Australasia and northwards to the Mediterranean.

- A. Plants densely covered with pellucid vesicles,
which glisten in the sun like particles of glass;
leaves ovate 1. *M. crystallinum*.
- B. Plants not covered with pellucid vesicles.
- I. Leaves linear, semi-terete; flowers nearly
sessile 2. *M. nodiflorum*.
- II. Leaves lanceolate, terete-conical; flowers
peduncled 3. *M. Forskålîi*.

407. (1.) **Mesembrianthemum crystallinum** L. Spec. Plant. I (1753), p. 688. — Boiss. Fl. Or. II, p. 764. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 78 no. 445. — Supplem. Fl. d'Eg., p. 758. — Sickenberg. Contrib., p. 237. — DC. Plant. Crass., tab. 128. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 648 no. 124. — Diffusely procumbent, herbaceous, covered with large, white glittering papulae; leaves opposite or in the branches alternate, clasping, ovate or spatulate, undulated; flowers axillary, almost sessile; calyx 5-cleft, tube campanulate, terete, lobes ovate, retuse and acute. — Flow. November.

M. ma. Marmarica; Matruqa; Bîr-Burdan; Abusîr; Tâbiet-el-Agmi; Ras-et-Tin; Alexandria-West and -East. — **M. p.** Abu-Mandur; Rosetta; Burg Mghêzil; Brullus; Damietta, in sandy places. — **D. a. sept.** Abassiye; Wady Dugla; Wady Rished; Wady Hof near Helwân, abundantly.

Local name: ghassûl-frengi (Ascherson); generally: gassûl.

The ice-plant is probably a native of South Africa. The annual plant is called by Haworth *Mesembrianthemum glaciale*, the biennial *Mesembrianthemum crystallinum*. Flowers white or rose-coloured.

408. (2.) **Mesembrianthemum nodiflorum** L. Spec. Plant. I (1753), p. 688. — Boiss. Fl. Or. II, p. 766. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 78 no. 446. — Supplem. Ill. Fl. d'Eg., p. 758. — Aschers. Flor. Rhinocol., p. 796 no. 117. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 648 no. 125. — Stems nearly erect or diffuse, much branched, 2,5—3,0 cm high, greyish-green; branches terete, more or less papulose, branchlets mostly secundate. Leaves opposite or alternate, semiterete or subterete, sometimes a little ciliated at the base, 1—5 cm long, 2—2,5 mm wide. Flowers sessile or very short-pedunculate, axillary or subterminal; calyx 4—5 cleft, lobes unequal, much longer than the minute petals, turbinate. — Flow. October to January.

M. ma. Marmarica; Matruqa; Mariut, gaf-el-bajudah; Alexandria-West and -East. sand-dunes. — **M. p.** In sandy and stony places near Rosetta; Qatiya; Mouth of the Nile near Damietta; El-'Arish.

— **N. d.** Alexandria, rice-fields along the canal; Birket-el-Hadj near Cairo; Damanhur; Tanta; Zaqa'ziq; Qalyûb. — **D. a. sept.** Gebel ahmar: Abassiya; Helwân; Wady Rished; Wady-Dugla. — **D. l.** Bir Lebak. — **D. i.** Ramses, desert, North of the Wady Tumilat; Tell-el-Kêbir; in sandy places near Suez.

Local name: ssemh; mulleyh (Schweinfurth-Ascherson, Muschler).

A very polymorphous plant. Also known from Sicily, Barbary and Cape.

409. (3.) **Mesembrianthemum Forskâlii** Hochst. in Schimp. Plant. Arab. exsicc. ed. II (1832). — Boiss. Fl. Or. II, p. 765. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 78 no. 446. — Supplem. Ill. Fl. d'Eg., p. 758. — Aschers. Flor. Sirb., p. 812 no. 15. — Sickenberg. Contrib. Fl. d'Eg., p. 237. — Mesembryanthemum geniculiflorum Forsk. Flor. aeg.-arab., p. 98 not L. — Papillose; branches short, very fleshy. Leaves opposite, short, fleshy, terete-conical, the upper ones decurrent. Flowers peduncled; calyx-lobes conical, unequal; petals longer than the calyx. — Flow. March to April.

M. p. El-Gels-Mohammediye; Qatiya. — **D. l.** Pyramids of Gîza; Abu-Roash. — **D. i.** Ramses; El-Qantara. — **D. a. sept.** Gebel ahmar; Gebel gerefe: Wady Dugla; Upper Wady Rished. — **D. a. mer.** Qoseyr; Suez, not rare.

Local name: ssemeh (Schweinfurth); hamd; tartir; generally: samh.

167. (2.) **Tetragonia** Linn.

Calyx-tube adnate to the ovary; lobes 3—5. Petals 0. Stamens ∞ (1- ∞) inserted in the calyx-tube. Ovary nearly wholly inferior, 2—8-celled; styles thick, densely papillose; ovules solitary, pendulous. Fruit a nut or drupaceous (horned or) winged, indehiscent. — Herbs or low shrubs with alternate entire succulent exstipulate leaves. Flowers axillary, solitary or few together, sessile or pedunculate, greenish-yellow (or reddish).

A small genus of 25 species. — Most of the species are peculiar to the Cape Flora. One (*T. expansa*, Murr.) of the Southern hemisphere and Japan is cultivated as spinach.

410. **Tetragonia expansa** Murr. in Comm. Goetting. VI (1783), p. 13. — A more or less succulent minutely papillose herb. Stems 30—60 cm high, decumbent or suberect, glabrous or sparingly puberulous. Leaves 2—10 cm long, ovate-rhomboid or triangular, obtuse or subacute, suddenly narrowed in to the petiole, quite entire or very obscurely sinuate. Flowers small, yellowish, solitary or rarely 2 together, sessile or on very short peduncles. Calyx-tube broadly turbinate; lobes about as long as the tube, broad, obtuse.

Stamens 12—20, irregularly inserted. Ovary 3—8-celled; styles the same number. Fruit about 1 cm long, hard and dry, almost turbinate, angular, usually furnished at the summit with 2—4 prominent teeth or horns. — Flow. March.

N. d. Sometimes naturalized in gardens of Cairo.

This has long been cultivated in Europe as an edible plant, under the name of „New Zealand spinach“. It is also a native of Australia and Tasmania, Norfolk Island and Lord Howe Island, Japan and extra-tropical South America.

168. (3.) **Trianthema** Linn.

Calyx 5-fid, lobes with a dorsal subapical cusp. Petals 0. Stamens 4—5—10 or ∞ , perigynous, when definite alternating with the calyx-lobes. Ovary free, usually obtuse, truncate or umbilicate at the top, 1—2-celled; styles 2 or 1; ovules solitary or ∞ , from a 'basilar placenta.' Capsule membranous or coriaceous, 1—2-celled, 1—2— ∞ -seeded, circumsciss. Seeds rotundate-reniform, compressed, often plicate-rugose, black; embryo annulate. — Herbs or undershrubs, glabrous or papillose. Leaves opposite, unequal, entire, linear to rotundate, often fleshy; petiole dilated with membranous stipuliform margins. Flowers axillary, solitary or fascicled in Egyptian species.

A small Old World genus, widely spread in warm regions.

411. **Trianthema pentandra** L. Mant. I (1762), p. 70. — Boiss. Flor. Or. II, p. 766. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 78 no. 450. — DC. Prodr. III, p. 352. — Diffuse, from a few cm to 60—90 cm in height, papillose more or less throughout, often obscurely so or nearly smooth and glabrous when dry. Leaves opposite-oblong to obovate-elliptical, obtuse, broadly pointed, distinctly petiolate; usually from 1—4 cm long, petiole 3—5 cm. Flowers in few- or many-flowered sessile or subsessile axillary fascicles; bracteoles thinly membranous. Calyx deeply 5-fid, lobes ovate to obovate-oblong, with a more or less distinct dorsal apiculus beneath the top. Stamens 5. Ovary turbinate above, 2-celled; styles 2, equalling the ovary; ovules geminate (or few). — Flow. March to April.

N. d. Tell-el-Kebîr (Schweinfurth); Qubba; Matariya (Sickenberger, Schweinfurth).

Occurs also in N. W. India.

169. (4.) **Aizoon** Linn.

Calyx-tube short, limb 5—4-partite, segments imbricate (or valvate). Petals 0. Stamens indefinite, about 12—60, sometimes

inserted in oligostemonous phalanges alternating with the calyx-lobes. Ovary free, depressed, 5—4-celled; styles free; ovules 2—∞ (6—10) in each cell. Capsule depressed, dehiscing loculicidally, the valves remaining affixed and incurved at the apex or free. — Herbs or suffrutescent, usually papillose-tomentose, the hairs often medio-fixed. Leaves alternate, exstipulate. Flowers axillary, solitary or in distichous spikes or contracted cymes.

A small genus of countries towards the Mediterranean, the Cape, and Australia.

- A. Erect or ascending; leaves opposite, oblong lanceolate, sessile obtuse 1. **A. hispanicum**.
 B. Procumbent; leaves alternate, obovate-spathulate, tapering into a petiole 2. **A. canariense**.

412. (1.) **Aizoon hispanicum** L. Spec. Plant. I (1753), p. 700. — Boiss. Fl. Or. II, p. 765. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 78 no. 448. — Sickenberg. Contrib. Fl. d'Eg., p. 237. — DC. Plant. Grass., tab. 30. — Erect or ascending, succulent, papillose, dichotomously branched. Leaves opposite, oblong-lanceolate, sessile, obtuse. Flowers somewhat pedicelled, solitary in the forks; calyx-tube top-shaped, with elongated, lanceolate lobes, 15 mm long, white within. — Flow. March to June. — Habit of *Mesembrianthemum nodiflorum*.

M. ma. Mariut-Bringi; everywhere near Alexandria-West and -East; Mandara. — **M. p.** Wady-el-'Arish. — **D. a. sept.** Origin of Wady Hof; Mouth of the Wady Warâq; Wady-Reil near Helwan; Wady Rished.

Also known from Cyrenaica, Tunisia, Algeria, Morocco, Spain, Italy, Arabia Petraea, Palestine, Syria, Kurdistan and Persia.

413. (2.) **Aizoon canariense** L. Spec. Plant. I (1753), p. 700. — Boiss. Fl. Or. II, p. 765. — DC. Plant. Grass., tab. 136. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 78 no. 449. — *Glinus crystallinus* Forsk. Flor. aeg.-arab., p. 95, tab. 14. — Papillose-villous; stems procumbent, rather woody, zigzag, alternately branched. Leaves alternate, obovate-spathulate, cuneate at base, tapering into a petiole. Flowers 3 mm broad, sessile in axils and along the branches; calyx-tube hemispherical, lobes broad, short triangular-ovate, 1 mm long, pale within. — Flow. January to June.

M. p. Qatiya; Rosetta; Damietta. — **D. i.** Terane; Abu-Roash; Pyramids of Giza and Saqqâra. — **D. i.** Makhsama; Tell-el-Kebîr; Sâlihîya; Ramses; El-Qantara. — **D. a. sept.** Wady Hamashiya; Wady Hof; Upper Wady Dugla; Wady Rished near Helwan, in great abundance; Wady Azhar; Wady Tin; Moqattam; Gebel ahmar;

Abasiya; Wady Liblab; Belbeys; Suez. — **D. a. mer.** Red Sea Coast near Ras Benass; hirsuta Lebara in sandy places.

Local name: Kusbet-el-belâd, hadâd, selq.

Also known from Tripolitania, Tunisia, Algeria, Morocco, Spain, Italy, Arabia, Syria, Persia, N. W. India.

170. (5.) **Telephium** Linn.

Sepals 5. Petals 5, inserted on an obscurely perigynous disk at the bottom of the calyx. Stamens 5, opposite the sepals. Styles 3, recurved. Capsule 3—4-valved, incompletely 3—4-celled by means of septa arising from valves. Seeds many, globular-reniform, affixed to a central placenta. — Fleshy herbs, with alternate, stipuled leaves, and flowers in terminal, capitate cymes.

A small genus of only a few species in the Mediterranean region.

414. **Telephium sphaerospermum** Boiss. Fl. Or. I (1867), p. 754 — and Diagnos. Plant. Orient. Ser. I fasc. IV, p. 12. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 49 no. 181. — Sickenberg. Contrib. Fl. d'Eg., p. 188. — Annual or biennial, 10 to 25 cm high, glabrous, glaucous; stems prostrate, simple, leafy. Leaves 5 to 8 mm long, oblong-elliptical, sometimes acutish vertically dissected. Capsule ovate-triquetrous, without a beak, 25—30-seeded; seeds small, globular. — Flow. January to March.

D. a. sept. Cairo: Ma'sara; Wady Hamâta; Galala; Wady Waraq; Wady Kherÿe; Wady Natfe. Upper Wady Rished, on calcareous ground.

Also known from Cyrenaica and Sinai.

171. (6.) **Mollugo** Linn.

Sepals 5, nearly equal, inside white, persistent. Petals 0. Stamens hypogynous or nearly so, 3—5- ∞ , with or without linear or filiform staminodes. Ovary free, 3—5-celled; stigmas as many, sessile or style very short; ovules ∞ , axile. Capsule loculicidally 3—5-valved, ∞ -spermous; seeds subreniform, compressed, usually minutely tubercled, with or without strophiole and funicle. — Erect or diffuse, glabrous or tomentose, often annual herbs. Radical leaves rosulate, cauline pseudo-verticillate, unequal. Stipules 0 or fugacious. Flowers axillary, fascicled or in diffuse or umbelliform cymes.

A small Tropical and subtropical genus.

415. **Mollugo Glinus** A. Rich. Tentam. Flor. Abyssinie. I (1847), p. 48. — Glinus lotoides L. Spec. Plant. I. p. 663. — Boiss. Fl. Or. I. p. 755. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 49 no. 182. — Sickenberg.

Contrib. Fl. d'Eg., p. 188. — Diffuse or ascending annual herb, more or less often densely tomentose or villous with chiefly stellate hairs; branches extending from a few cm to 30 to 60 cm high, dichotomous. Leaves from rotundate with cuneate base to obovate or oblanceolate, apex rounded or broadly pointed, obsolete denticulate or entire; lamina 2 cm long or less, narrowed into the petiole which is shorter than or rarely equalling the lamina. Flowers usually in rather close axillary fascicles; pedicels shorter than the calyx. Stamens ∞ or varying to 5, with a few filamentous staminodes. Stigmas 2—5; style very short. Seeds with a conspicuous vesicular strophiole sometimes about as large as the tubercled seed and a straight or involute slender white funiculiform appendage. — There are two principal forms which may be specifically distinct, viz., 1. Stem and leaves hoary-tomentose; sepals 0.63—0.75 cm long. 2 (Var. *virens*, Fenzl), less tomentose, leaves sometimes green and glabrate; sepals 3 mm long. — Flow. March to April.

N. d. Alexandria; Kafr Zayat; Cairo; between Gassatin and Tell-el-Kebîr; Damanhur; Mehallet-el-Kebîr; Mansura; Tanta; Zifta; Zaqaziq; Qalyûb. — **N. v.** Beni-Suêf; Minia; Roda; Siut; Ekhmîm; Kene; Luksor; Aswân; everywhere on alluvial sort.

Local name: moghêra; ghobêrâ (Luksor-Schweinfurth).

A characteristic plant of the Nile clay. Widely spread from South Europe and North Africa eastward to India and Australia; occurring also in America.

31. Portulaccaceae.

Herbs, usually fleshy and glabrous, occasionally clothed with long hairs. Leaves opposite or rarely alternate, entire, generally exstipulate. Flowers regular, bisexual. Sepals 2, rarely more, imbricate. Petals 4—5, hypogynous or rarely perigynous, free or united below. Stamens either equal in number to the petals and opposite to them or indefinite, often adnate to the base of the petals. Ovary free or rarely half-inferior, 1-celled; style 3—8-fid; ovules few or many, affixed to a free central or basal placenta. Fruit a capsule, either dehiscing with as many valves as style-branches, or opening by a transverse lid. Seeds 1 to many, embryo curved round a farinaceous albumen.

A small order, having its headquarters in America; found more sparingly in South Africa and Australia; decidedly rare in Asia, North Africa, and Europe. Genera 16; species about 125. Some of the American genera are shrubby; and the widely distributed *Portulacca* (naturalized in Egypt) differs from the rest of the order in having perigynous petals and stamens, and a half-inferior ovary.

172. *Portulacca* Linn.

Calyx bipartite, the tube cohering with the ovary below. Petals 4—6, with the 8—20 stamens inserted on the calyx, fugacious. Ovary roundish. Style 3—8-parted. Capsule subglobose, 1-celled, dehiscing transversely about the middle. Seeds numerous, affixed to a central placenta. — Low herbaceous, fleshy herbs, with scattered quite entire leaves.

A genus of about 20 species in the Tropics and Subtropics of both hemispheres.

416. *Portulacca oleracea* L. Spec. Plant. I (1753), p. 638. — Boiss. Flor. Or. I, p. 757. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 50 no. 183. — Sickenberg. Contrib. Fl. d'Eg., p. 188. — Annual, 20 to 50 cm high, prostrate. Leaves sessile, obovate-oblong. Flowers sessile in forks; sepals unequal, obtuse, keeled beneath the tip; petals yellow. — Flow. March to April.

M. ma. Almaïda; Bîr-Burdân; Alexandria-West and -East; Mandara; Abukir. — **N. d.** Damanhur; Shabbâs-es-Shehra; Mehallet-el-Kebîr; Mansura; Qalyûb; Cairo; Makhsama; Ramses; Ismailia. — **N. f.** Senhûr; Senûris; El-Hammâm; Medînet-el-Fayûm; Kôm-Fâris; Tamia. — **N. v.** Feshn; Minia; Beni-Suêf; Siut; Ekhmîm; Ballas; Kene; Luksor; Esne; Aswân. — **O.** Siwa; Little Oasis; Farâfra; Dakhel; Great Oasis, in great abundance. — **D. a. sept.** Wady Dugla (!).

Local name: Higl, in Nubia: segettemâm.

A cosmopolitan herb.

32. *Caryophyllaceae*.

Herbs, very rarely woody at the base; branches usually swollen at the nodes. Leaves opposite, quite entire or minutely serrate, often united at the base; stipules scarious or wanting. Flowers regular, bisexual. Sepals 4—5, free or cohering into a tubular calyx, imbricate. Petals 4—5 or occasionally absent, hypogynous or rarely perigynous, entire or lobed. Stamens 8—10, rarely fewer, inserted with the petals. Ovary free, 1-celled or imperfectly 3—5-celled at the base; styles 2—5, free or more or less connate into a single style; ovules 2 to many, attached to a free central (in moist genera) or basal placenta. Fruit usually capsular, splitting into as many or twice as many valves as styles, very rarely indehiscent. Seeds few or many; albumen farinaceous, usually more or less surrounded by the narrow curved embryo.

A large and very natural family, found in every part of the world, but most abundant in temperate regions, particularly of the Northern Hemisphere;

rare in the tropics, unless on high mountains. Genera about 38; species 1000 or more. The order contains some handsome garden plants, as the various kinds of carnations and pinks, but as a whole the species are insignificant, possessing no important properties or uses.

A. *Silenoideae*. — Calyx 4—5-lobed. Petals and stamens inserted on the enlarged disk. Styles free from the base. Stipules 0.

I. *Diantheae*. — Seeds shield-shaped, with the hilum on the face. Styles 2. Embryo straight.

a) Bracts beneath the flowers 1. *Dianthus*.

b) No Bracts beneath the flowers 2. *Vaccaria*.

II. *Lychnideae*. — Seeds kidney-shaped or nearly globular, with a lateral hilum. Embryo peripheral or spiral.

a) Commissural nerves of the calyx 0 . . . 3. *Gypsophila*.

b) Commissural nerves of the calyx manifest 4. *Silene*.

B. *Alsinoideae*. — Sepals free or united at the base by the small disk. Styles free or united.

I. Fruit a capsule dehiscent by teeth.

a) Styles free from the base.

1. *Alsineae*. — Stipules 0.

α) Valves of the capsule undivided, as many as styles or fewer.

† Styles as many as sepals, alternating with them; petals minute or 0 5. *Sagina*.

†† Styles 2—3, opposite to the external sepals; petals 5 . . . 6. *Alsine*.

β) Valves or teeth of the capsule twice as many as styles.

† Petals 5, entire; Stamens 10, perigynous 7. *Arenaria*.

†† Petals 4—5, bifid or bipartite; stamens 10, hypogynous or perigynous 8. *Stellaria*.

2. *Sperguleae*. — Leaves stipulate.

a) Styles 5; leaves pseudo whorled . . . 9. *Spergula*.

β) Styles 3; leaves opposite 10. *Spergularia*.

b) *Polycarpeae*. — Styles connate at the base.

1. Petals clawed, with ovate or cordate limb 11. *Robbeirea*.

2. Petals obovate or oblong.
 - α) Sepals entire. 12. *Polycarpon*.
 - β) Sepals 2-toothed. 13. *Loeflingia*.
 3. Petals lanceolate, half as long as the calyx 14. *Polycarpia*.
- II. Fruit an indehiscent utricle.
- a) *Paronychieae*. — Flowers equal.
 1. Tufted, prostrate, grey or green herbs 15. *Herniaria*.
 2. Prostrate herbs with silvery, scarious bracts 16. *Paronychia*.
 3. Branched, salsola-like shrub, with cymose, reddish flowers 17. *Gymnocarpus*.
 4. Dwarf, desert herbs, with spiny fruiting heads. Petals 0 18. *Sclerocephalus*.
 - b) *Pterantheae*. — Flowers unequal. Cymes 3-branched, the central bearing one, fertile flower, the lateral one sterile.
 1. Sepals and stamens 4. Sterile branches of the cyme pinnate bearing a bundle of hooks 19. *Pteranthus*.
 2. Sepals and stamens 5. Sterile branches of the cyme plumose 20. *Cometes*.

173. (1.) *Dianthus* Linn.

Flowers terminal, solitary or cymose-paniculate, generally purple. Calyx 5-toothed, finely and equally many-striate, tubular, several-bracted at the base. Petals 5, long-clawed, dentate or crenate. Stamens 10, Styles 2. Ovary 1-celled, stipitate. Capsule cylindric or oblong, stalked, dehiscent by 4 or 5 short teeth at the summit. Seeds compressed, laterally attached. Embryo straight, excentric. — Stiff perennial (rarely annual) herbs, mainly with narrow leaves.

Species about 100, natives of the Old World; one of Siberia extending into Arctic America.

A. Annual. Leaves small-linear or linear-lanceolate 1. *D. Cyri*.

B. Perennial. Leaves broad spathulate 2. *D. Guessfeldtianus*.

417. (1.) *Dianthus Cyri* Fisch. and Mey. Ind. Sem. Hort. Petrop. IV (1828), p. 34. — Boiss. Fl. Or. I, p. 482. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 45 no. 132. — Sickenberg. Contrib. Fl. d'Eg., p. 184. — Annual, 30 to 50 cm high, glabrous, erect with spreading branches. Leaves scabridulous, somewhat rigid, linear or rarely linear-lanceolate, those of the branches often with a setaceous tip. Flowers solitary at the apex of rigid, somewhat incurved branches; bracts ovate 4.

often with a setaceous tip, attenuate, longer than the calyx; calyx-teeth lanceolate, nervose-striate, scarious at the tip; limb oblong 5—6-dentate, rose-coloured. — Flow. December to March.

O. Little Oasis; Dakhel; Great Oasis. — **N. d.** Tell-el-Kebir. Also known from Anatolia, Assyria and Afghanistan.

418. (2.) **Dianthus Guessfeldtianus** Muschler spec. nov. — Perennial, 25 to 50 cm high, glabrous, erect, branching from the base. Leaves glaucous, glabrous, spathulate, attenuate at the base, long petioled, at the tip with a very fine mucronula, one-nerved, 10—15 cm long, 0.5—1 cm broad. Flowers solitary at the top of the rigid, never incurved branches; bracts 4, broad ovate-lanceolate, acute, with small membranous margin, with a setaceous tip, shorter than the calyx, calyx-teeth small linear-lanceolate, nervose-striate, scarious at the tip; limb lanceolate or small ovate-lanceolate, dentate, pale-lilac. — Flow. April.

D. a. sept. Upper Wady-Azkhar, Galala (Schweinfurth no. 218). In the structure of the flower this is a species of the section Fimbriati.

174. (2.) **Vaccaria.**

Calyx scaly at the base sharply angular, tubular, ∞ -nerved, 5-toothed. Petals 5, with spreading, entire, dentate, or fringed limb, glabrous or hairy above. Stamens 10. Torus elongated into a gynophore. Capsule cylindrical or ovate, ∞ -seeded, 4-toothed. Hilum central. Embryo eccentric. — Herbs, mostly perennial, with grass-like leaves, and showy flowers.

A small genus of only 3 species in Asia; *Vaccaria segetalis* also in Europe.

419. **Vaccaria segetalis** Garcke in Ascherson Flor. Prov. Brandenbg. I (1864), p. 84. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 46 no. 134. — Sickenberg. Contrib. Fl. d'Eg., p. 184. — Saponaria Vaccaria L. Spec. Plant. I, p. 585. — Boiss. Fl. Or. I, p. 525. — Aschers.-Schweinf. Suppl. Fl. d'Eg., p. 748. — Annual, 20 to 50 cm high; Lower leaves tapering at the base, the others cordate-lanceolate. Calyx cylindrical or oblong-cylindrical with numerous, generally obscure nerves, teeth triangular, scarious-margined. Petals 5, with narrow, bilamellate claw, limb distinct from the claw, pink, obovate, half as long as the calyx. Stamens 10. Torus small or elongated into a carpophore. Ovary many-ovuled, with a cylindrical placenta. Capsule obovate or obovate-oblong, its wall separating into an outer pergamentaceous and an inner silk paperlike layer, splitting into 4 short valves or teeth. Seeds kidney-shaped, affixed by a marginal hilum. — Flow. March to April.

M. ma. Montaza; Bîr-Burda; Abusîr; Alexandria-East and -West; Mandara; Abukîr. — **M. p.** El-'Arish. — **N. d.** Damanhur; Er-Rah-mâniya; Mehallet-el-Kebîr; Tanta; Zifta; Qalyûb; Cairo; Ramses; Gassatin. — **N. f.** Medînet-el-Fayûm; Begîq; Abuksa; Senhûr; Senûris; Kafr-Mukfût. — **O.** Little Oasis; Great Oasis; Dakhel; Farâfra.

Local name: Fûl-el-'arab (Ascherson).

Also known from Europe, Northwestern Africa, and Asia.

175. (3.) *Gypsophila* Linn.

Calyx turbinate or campanulate, 5-toothed, 5-nerved, bractless. Petals 5, entire or emarginate, their claws narrow. Stamens 10, styles 2. Capsule dehiscent by 4 valves extending to or below the middle. Seeds reniform, laterally attached; embryo coiled. — Annual or perennial, branching or diffuse, mostly glabrous and glaucous herbs, with narrow leaves, and small numerous axillary or paniculate flowers.

A genus of about 60 species, natives of Europe, Asia and northern Africa.

420. *Gypsophila Rokejeka* Del. Illustr. Flor. d'Eg. (1813), p. 282 tab. 29 fig. 1. — Boiss. Fl. Or. I, p. 543. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 46 no. 135. — Aschers. Fl. Rhinoc., p. 791 no. 41. — Perennial, 40 to 60 cm high; glabrous, glaucescent, woody below; stems slender, whitish, dichotomously panicle from the base. Leaves fleshy, 1-nerved, with papillose margins, the lower ones oblong-lanceolate, obtuse, the others linear-lanceolate, acute, often channelled. Bracts linear, herbaceous; pedicels capillary, 4—6-times as long as the calyx; calyx campanulate, 2 mm long, divided to three-fourths its length into oblong, white-margined lobes; petals pink to violet, elliptical-oblong, twice as long as calyx. — Flow. December to April.

M. p. El-'Arish. — **D. a. sept.** Kharûba (Ascherson): Everywhere in the Wadies on calcareous ground, but very rare in sandy places.

Local name: roqeyqa (Forskål; Delile); sirr (Forskål); Kuzâma (Muschler).

Also known Sinai, Syria and Palestine.

176. (4.) *Silene* Linn.

Calyx more or less inflated, ovoid, campanulate clavate or tubular, 5-toothed or cleft, 10-rarely many-nerved. Petals 5; claw narrow; limb entire, bifid or laciniate, usually with two basal scales. Stamens 10, 5 usually adnate to the petals. Disk usually produced

into a long gynophore. Ovary incompletely 3-(rarely 1-)celled; styles 3 rarely 5; ovules numerous. Capsule 3—5-toothed or valved. Seeds reniform, usually tubercled, hilum marginal; embryo annular. — Annual or perennial herbs. Flowers solitary or cymose, often second on the branches of the cyme.

A genus of about 300 species, chiefly natives of temperate Europe and Asia.

A. Annuals.

I. Calyx 30-nerved, ovate-cylindrical, or club-shaped, in fruit contracted at the mouth

1. *S. conoidea*.

II. Calyx 10-nerved, cylindrical, or club-shaped. Capsule 3-celled at the base.

a) Inflorescence dichotomous, cymose or racemose. Branches not filiform.

1. Calyx glabrous, mouth contracted in fruit

2. *S. Behen*.

2. Calyx scabrous-bristly or hirsute along the nerves.

α) Nerves of the calyx without venules

3. *S. gallica*.

β) Nerves of the calyx reticulate-venulose

4. *S. cerastioides*.

b) Flowers in one-sided racemes. Calyx hirsute or papillary, apex not contracted in fruit.

1. Seeds with flat face and obtusely grooved back

5. *S. villosa*.

2. Seeds with ear-shaped depression at the face and obtusely grooved back.

α) Capsule with a carpophore.

† Villous; leaves obovate-spathulate, obtuse

6. *S. obtusifolia*.

†† Pubescent; leaves linear-subulate, acutish

7. *S. setacea*.

β) Capsule without a carpophore . .

8. *S. nocturna*.

3. Seeds with a subconcave face, canaliculate, bicarinate at the back . . .

9. *S. canopica*.

4. Face of the seeds smooth, rather concave, back deeply grooved with two wavy wings.

α) Leaves oblong-linear to linear, acute; peduncles longer than the calyx

10. *S. apetala*.

β) Leaves obovate, obtuse; peduncles shorter than the calyx

11. *S. colorata*.

c) Inflorescence dichotomous, ending in racemes or cymes. Calyx hairy or glabrous, apex not contracted in fruit. Tender herbs.

1. Seeds more or less compressed . . . 12. *S. rubella*.

2. Seeds almost globular, with a pore at each side of the hilum 13. *S. aegyptiaca*.

d) Inflorescence irregularly dichotomous. Mouth of the calyx not contracted in fruit. Rigid plants with filiform branches and peduncles.

1. Peduncles shorter than the calyx . . . 14. *S. linearis*.

2. Peduncles longer than the calyx . . . 15. *S. Hussoni*.

B. Perennials.

I. Plants succulent 16. *S. succulenta*.

II. Plants not succulent 17. *S. longipetala*.

421. (1.) **Silene conoidea** L. Spec. Plant. ed. 1 (1753), p. 598. — Boiss. Fl. Or. I, p. 580. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 46 no. 136. — 2 to 4, pubescent-viscid. Leaves oblong-lanceolate, acute. Calyx conic-cylindrical, umbilicate at the base, teeth lanceolate-subulate one-third as long as the tube, in fruit globular-inflated at the base; limb pink, obovate, entire, or eroded-denticulate; capsule 20 mm long, sessile, globular, tapering abruptly into a long conical beak. — Flow. March to April.

N. d. Tell-el-Kebîr (Schweinfurth).

Also known from South-Europe, Asia and India.

422. (2.) **Silene Behen** L. Spec. Plant. I (1753), p. 599. — Boiss. Fl. Or. I, p. 853. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 46 no. 137. — Rohrb. Monogr. Silene, p. 169. — Annual, 30 to 40 cm high, glabrous, glaucescent. Leaves obovate, acute, to oblong-lanceolate. Alar flowers peduncled, the upper loosely racemed, subsessile; calyx oblong from the umbilicate base, with reddish veins, in fruit inflated, ovate, teeth ovate, obtuse, membranous-margined; limb pink, minute, bipartite almost to the base into obovate-oblong lobes; capsule ovate, short-stipitate. — Flow. February to March.

M. ma. Ramle; Abukîr.

Also known South Europe, Cyrenaica, Asia, Syria and Palestine.

423. (3.) **Silene gallica** L. Spec. Plant. I (1753), p. 595. — Boiss. Fl. Or. I, p. 590. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 46 no. 138. — Supplement. Fl. d'Eg., p. 748. — Sickenberg. Contrib. Fl. d'Eg., p. 184. — *Silene quinquevulnera* L. Spec. Plant. I, p. 595. —

into a long gynophore. Ovary incompletely 3-(rarely 1-)celled; styles 3 rarely 5; ovules numerous. Capsule 3—5-toothed or valved. Seeds reniform, usually tubercled, hilum marginal; embryo annular. — Annual or perennial herbs. Flowers solitary or cymose, often second on the branches of the cyme.

A genus of about 300 species, chiefly natives of temperate Europe and Asia.

A. Annuals.

- I. Calyx 30-nerved, ovate-cylindrical, or club-shaped, in fruit contracted at the mouth 1. *S. conoidea*.

- II. Calyx 10-nerved, cylindrical, or club-shaped. Capsule 3-celled at the base.

- a) Inflorescence dichotomous, cymose or racemose. Branches not filiform.

1. Calyx glabrous, mouth contracted in fruit 2. *S. Behen*.

2. Calyx scabrous-bristly or hirsute along the nerves.

- α) Nerves of the calyx without venules 3. *S. gallica*.

- β) Nerves of the calyx reticulate-venulose 4. *S. cerastioides*.

- b) Flowers in one-sided racemes. Calyx hirsute or papillary, apex not contracted in fruit.

1. Seeds with flat face and obtusely grooved back 5. *S. villosa*.

2. Seeds with ear-shaped depression at the face and obtusely grooved back.

- α) Capsule with a carpophore.

- † Villous; leaves obovate-spathulate, obtuse 6. *S. obtusifolia*.

- †† Pubescent; leaves linear-subulate, acutish 7. *S. setacea*.

- β) Capsule without a carpophore 8. *S. nocturna*.

3. Seeds with a subconcave face, canaliculate, bicarinate at the back 9. *S. canopica*.

4. Face of the seeds smooth, rather concave, back deeply grooved with two wavy wings.

- α) Leaves oblong-linear to linear, acute; peduncles longer than the calyx 10. *S. apetala*.

- β) Leaves obovate, obtuse; peduncles shorter than the calyx 11. *S. colorata*.

- c) Inflorescence dichotomous, ending in racemes or cymes. Calyx hairy or glabrous, apex not contracted in fruit. Tender herbs.
1. Seeds more or less compressed . . . 12. *S. rubella*.
 2. Seeds almost globular, with a pore at each side of the hilum 13. *S. aegyptiaca*.
- d) Inflorescence irregularly dichotomous. Mouth of the calyx not contracted in fruit. Rigid plants with filiform branches and peduncles.
1. Peduncles shorter than the calyx . . . 14. *S. linearis*.
 2. Peduncles longer than the calyx . . . 15. *S. Hussoni*.

B. Perennials.

- I. Plants succulent 16. *S. succulenta*.
- II. Plants not succulent 17. *S. longipetala*.

421. (1.) **Silene conoidea** L. Spec. Plant. ed. 1 (1753), p. 598. — Boiss. Fl. Or. I, p. 580. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 46 no. 136. — 2 to 4, pubescent-viscid. Leaves oblong-lanceolate, acute. Calyx conic-cylindrical, umbilicate at the base, teeth lanceolate-subulate one-third as long as the tube, in fruit globular-inflated at the base; limb pink, obovate, entire, or eroded-denticulate; capsule 20 mm long, sessile, globular, tapering abruptly into a long conical beak. — Flow. March to April.

N. d. Tell-el-Kebîr (Schweinfurth).

Also known from South-Europe, Asia and India.

422. (2.) **Silene Behen** L. Spec. Plant. I (1753), p. 599. — Boiss. Fl. Or. I, p. 853. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 46 no. 137. — Rohrb. Monogr. Silene, p. 169. — Annual, 30 to 40 cm high, glabrous, glaucescent. Leaves obovate, acute, to oblong-lanceolate. Alar flowers peduncled, the upper loosely racemed, subsessile; calyx oblong from the umbilicate base, with reddish veins, in fruit inflated, ovate, teeth ovate, obtuse, membranous-margined; limb pink, minute, bipartite almost to the base into obovate-oblong lobes; capsule ovate, short-stipitate. — Flow. February to March.

M. ma. Ramle; Abukîr.

Also known South Europe, Cyrenaica, Asia, Syria and Palestine.

423. (3.) **Silene gallica** L. Spec. Plant. I (1753), p. 595. — Boiss. Fl. Or. I, p. 590. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 46 no. 138. — Supplement. Fl. d'Eg., p. 748. — Sickenberg. Contrib. Fl. d'Eg., p. 184. — *Silene quinquevulnera* L. Spec. Plant. I, p. 595. —

M. ma. Abusîr; Alexandria-West and -East; Mandara; Abukîr. — **M. p.** El-'Arîsh; El-Grâdy (Ascherson). — **D. i.** Sâlihiya; Tell-el-Kebîr; Ramses. — **D. a. sept.** Northern and Southern Galala.

Also known from Tripolitania, Palestine and Arabia.

428. (8.) **Silene nocturna** L. Spec. Plant. I (1753), p. 595. — Boiss. Fl. Or. I, p. 595. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 46 no. 143. — Sickenberg. Contrib. Fl. d'Eg., p. 185. — Annual, 30—40 cm high, puberulent; stem erect, simple or sparingly branched. Leaves spatulate to oblong or oblong-linear, acute. Raceme loose; lower peduncles as long as the calyx or longer, the others shorter; bracts somewhat unequal, longer than the peduncles; calyx 10 mm long, oblong in flower and fruit, tapering at the base. teeth lanceolate, acute; limb small, whitish, livid below, cuneate, bifid; capsule oblong, sessile. — Flow. March to April.

M. ma. Ramle (Letourneux). — **D. i.** Wady Tumilat; Tell-el-Kebîr. — **N. d.** El-Merg. — **O.** Little Oasis; Farâfra; Dakhel; Khargeh.

Also known from Cyrenaica, Tropolitania, Tunisia, Algeria, Morocco, Arabia and Syria.

429. (9.) **Silene canopica** Del. Ill. Flor. d'Eg. (1813), no. 442 (without Description). — Boiss. Fl. Or. I, p. 596. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 46 no. 144. — Supplem. Fl. d'Eg., p. 749. — Sickenberg. Contrib. Fl. d'Eg., p. 185. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 597 no. 38. — Canescent; stems numerous, procumbent, simple, dichotomously-branched. Leaves oblong or oblong-lanceolate. Flowers peduncled; peduncles erect, twice or thrice shorter than the calyx; calyx adpressed canescent, attenuate from the base, cylindric, teeth lanceolate, obtuse, dense ciliate; limb white, bipartite to the middle; capsule ovate as long as the carpophore. — Flow. March to May.

M. ma. Marmarica; Matruqa; Abusîr; Montaza; Alexandria-West and -East — **M. p.** El-'Arîsh; Rosetta; Damietta. — **D. i.** Tell-el-Kebîr.

Only known from Lower-Egypt and Western Marmarica. — cf. Aschers.-Schweinf. Supplem., p. 749: Obs. Boissier (Suppl. Fl. Or. 94) en suivant Rohrbach (Monogr. d. Gatt. Silene, p. 105) remplace le nom de *Silene canopica* Del. par celui de *S. biappendiculata* Ehrenb. Rohrbach n'avait préféré le dernier que séduit par la supposition erronée, que les échantillons de „*S. canopica* Del.“ de Dendérah distribués par Sieber étaient authentiques. Cette plante de Sieber appartient au *S. villosa* Forsk., espèce qui ne se trouve pas à Aboûqîr, emplacement de l'ancienne Canopus, où le *S. biappendiculata* abonde, qui d'après les types de l'herbier de Montpellier est bien le *S. canopica* Del. Ces

deux noms n'ont pris date que par deux descriptions posthumes publiées dans la même année de 1867; celui de Delile par celle de Boissier (Fl. Or. I. 596), celui de Ehrenberg par la description de Rohrbach (Botanische Zeitung, 1867, 82). Or, il nous semble hors de doute que le nom de *S. canopica* Del. doit être préféré.

430. (10.) **Silene apetala** Willd. Spec. Plant. IV (1799), p. 307. — Boiss. Fl. Or. I. p. 596. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 46 no. 145. — Sickenberg. Contrib. Fl. d'Eg., p. 185. — Aschers.-Schweinf. Suppl. Fl. d'Eg., p. 749. — Aschers.-Schweinf. Prim. Flor. Marm., p. 597 no. 39. — Annual, 20–30 cm high; appressed-pubescent; stem erect, simple or dichotomous. Leaves oblong-linear to linear-lanceolate. Flowers loosely racemose, the upper irregularly cymose; peduncles longer than 8 mm long, green, campanulate, in fruit obovate. calyx; calyx teeth lanceolate, acute; petals minute, included, denticulate; capsule globular, sessile. — Flow. March to May.

M. ma. Abusir; Alexandria-West and -East; Mandara, not rare; Abukir. — **M. p.** Rosetta. — **O.** Little Oasis.

Also known from Cyrenaica, Tripolitania, Tunisia, Algeria, Morocco, South-Europe, Persia and Afghanistan.

var. **alexandrina** Ascherson in Aschers.-Schweinf. Ill. Fl. d'Eg. (1887), p. 46 no. 145. — Sickenberg. Contrib. Fl. d'Eg., p. 185. — Aschers.-Schweinf. Primit. Flor. Marm., p. 597 no. 39. — Nerves of the calyx densely hirsute. — Flow. March to April.

M. ma. Marmarica; Matruqa; Alexandria.

Also known from other parts between the Great Syrt and Alexandria.

431. (11.) **Silene colorata** Poir. Voy. II (1789), p. 163. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 46 no. 146. — Supplem. Fl. d'Eg., p. 749. — Aschers. Flor. Rhinocol., p. 792 no. 44. — Sickenberg. Contrib. Fl. d'Eg., p. 185. — *Silene bipartita* Desf. Flor. Atlant. I. p. 352 tab. 100. — Boiss. Fl. Or. I, p. 597. — Annual, 20 to 40 cm high; appressed pubescent; stems ascending or procumbent at the base, rarely erect, simple or dichotomous. Leaves obovate obtuse, to oblong-linear acute; bracts small, oblong-lanceolate, unequal. Peduncles shorter than the 2 cm long calyx; calyx red-nerved, obconical-cylindrical from umbilicate base, in fruit club-shaped, teeth oblong, obtuse; limb pink, bifid into obovate or linear lobes; capsule ovate, once to twice as long as the carpophore. — Flow. March to April.

M. ma. Alexandria.

Also known from Tripolitania, Cyrenaica, Arabia Petraea, Syria, Mesopotamia and Persia.

var. **Oliveriana** Rohrb. Monograph. Gattg. *Silene* (1868), p. 116. — Aschers.-Schweinf. Supplem. Fl. d'Eg., p. 749. — Aschers. Flor. Rhinocol., p. 792 no. 44. — Sickenberg. Contrib. Fl. d'Eg., p. 185. — *Silene Oliveriana* Otth. ap. DC. Prodrum. I. p. 373. — Boiss. Fl. Or. I, p. 597. — Leaves narrower. Calyx green-nerved. Limb white or pale pink, with linear lobes.

M. p. Between Qatiye, El-'Arish and Ghassa (Kotschy no. 1135, 1334. — Barbey).

Local name: 'aïn-el-bint.

Also known from Tripolitania, Cyrenaica, Arabia Petraea, Syria, Mesopotamia and Persia.

432. (12.) ***Silene rubella*** L. Spec. Plant. I (1753), p. 600. — Boiss. Fl. Or. I, p. 598. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 46 no. 147. — Sickenberg. Contrib. Fl. d'Eg., p. 185. — Annual 30 to 50 cm high; puberulent, glaucescent; stems unequally dichotomous. Leaves obovate-spathulate to linear, obtuse. Peduncles of alar flowers rather long, of the more or less cymose, terminal ones short; calyx membranous, oblong, in fruit top-shaped, teeth rounded, obtuse, ciliate; limb pink, obovate-cuneate, retuse; capsule ovate, 2—3 times as long as the carpophore. — Flow. March to April.

M. ma. Bîr-Burda; Abusîr; Alexandria-West and -East; Mandara; Abukîr. — **M. p.** Rosetta. — **N. d.** Desuq; Mehallet-el-Kebîr; Mansura; Tanta; Zaqaziq; Merâf; Tell-el-Kebîr; Cairo; Merg. — **N. f.** Medînet-el-Fayûm; Tamia; Senûris; Senhûr.

Local name: antaliye (Ascherson) nashâssh-ell-elubân.

Also known from Mesopotamia, Syria, South Europe, Algeria, Morocco, Tunisia, Tropolitania, Cyrenaica.

433. (13.) ***Silene aegyptiaca*** (L.) L. fil. Supplem. (1781), p. 241. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 47 no. 148. — Annual, 20 to 30 cm high, crisp-puberulent; stems ascending, dichotomous. Leaves ovate, the lower with margined petioles, obtuse, the upper sessile, acute. Alar flowers short, peduncled, the terminal one nearly sessile, cymose; calyx red, obsoletely nerved, cylindrical, from umbilical base, in fruit club-shaped, teeth membranous-margined, ovate, obtuse; limb pink, bilobed, with a tooth on each side at the base; capsule oblong, somewhat shorter than the carpophore. — Flow. March to May.

M. ma. Alexandria.

Also known from Algeria and Tunisia, in Syria the commonest and most showy of all the species, often covering a large space with its pretty 2 cm broad flowers.

432. (14.) **Silene linearis** Decsne. Flor. Sinaic. (1835), p. 52. — Boiss. Fl. Or. I, p. 602. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 47 no. 149. — Sickenberg. Contrib. Fl. d'Eg., p. 185. — *Silene microsperma* Fenzl in Russ. Reis. II, p. 916. — An annual erect herb, 30—50 cm high, glaucescent, pubescent, rarely glabrous, viscid above; stem dichotomous. Leaves lanceolate to linear-subulate. Upper peduncles often shorter than the calyx; calyx green nerved, cylindrical-club-shaped, in fruit abruptly constricted at the base of the capsule, teeth triangular, acute, white-margined, limb of petals white, nearly 2-parted into linear-lobes; capsule ovate-oblong, shorter than the carpophore. — Flow. April to May.

D. a. sept. Wady Hof; Wady Khafûra; Wady Tîn; Upper Wady Rished; Wady Gerrawi; Wady Dugla. — **D. a. mer.** Qoseyr; Wady Gadire; Wady Etît.

Local name: 'abeyse; abne (Schweinfurth) moswâk (Klunzinger). Also known from Arabia Petraea, Syria and Palestine.

433. (15.) **Silene Hussoni** Boiss. Diagn. Plant. Or. sér., I fas. VIII (1849), p. 76. — Flor. Or. I, p. 604. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 47 no. 150. — A small annual herb, 4—7 cm high; hirtellous, viscidulous, dichotomous. Leaves oblong-lanceolate to linear. Peduncles longer than the calyx; calyx top-shaped, 4 mm long, netted veined, with triangular, membranous-margined teeth, one-third its length; limb of petals white, bifid into linear lobes; capsule ovate, twice as long as the carpophore. — Flow. March to April.

D. a. sept. Wady 'Araba (Figari Bey); Wady Sannûr (Husson). Also known from Syria and Palestine.

434. (16.) **Silene succulenta** Forsk. Flor. aeg.-arab. (1775), p. 89. — Boiss. Fl. Or. I, p. 648. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 47 no. 151. — Sickenberg. Contrib. Fl. d'Eg., p. 185. — Del. Ill. Flor. d'Eg., tab. 29 fig. 2. — Aschers.-Schweinf. Primit. Fl. Marmar., p. 597 no. 41. — Perennial, 10—20 cm high, velvety-papillose, somewhat viscid, many-stemmed from a thick, vertical root; stems diffuse, indurated at the base, densely leafy. Leaves fleshy, oblong-spathulate, obtuse, the floral ones lanceolate, usually as long as the peduncles. Flowers irregularly cymose, or forming a short, dense, leafy raceme; peduncles shorter than the calyx; calyx 2 cm long, cylindrical, in fruit club-shaped, teeth subulate from a lanceolate base, at length recurved; claws of petals exerted; limb bifid to middle into oblong-spathulate lobes; capsule oblong, somewhat longer than the carpophore. — Flow. April to June.

M. ma. Sandy places; Bîr Burdân; Abusîr; Alexandria-West and -East rare; Abukîr. — **M. p.** Rosetta; Brullus; El-'Arish.

Local name: zazawa; khasir; 'atar.

Also known from Tunisia, Tripolitania, Syria and Creta.

435. (17.) **Silene longipetala** Vent. Descr. Plant. Nouv. cult. jard. Cels (1800), tab. 83. — Boiss. Fl. Or. I, p. 636. — Rohrb. Monogr. Gattg. Silene, p. 221. — Achers.-Schweinf. Supplem. Ill. Fl. d'Eg., p. 749 no. 1272. — Aschers. Fl. Rhinoc., p. 792 no. 45. — Perennial, 40—60 cm high, sparingly puberulent below, glabrous-viscid above. Lower leaves oblanceolate, acute, tapering into a petiole, the floral ones lanceolate to linear-lanceolate. Branches of the somewhat one-sided broad panicle long, spreading, 3—7-flowered; calyx 8—10 mm long, in flower obconical, in fruit turbinate, teeth ovate, obtuse; claw of petals ciliate; limb white, bipartite into long, linear lobes; capsule somewhat exserted, ovate-spherical, four times as long as the carpophore. — Flow. March to May.

M. p. El-'Arish.

Also known from Cyrenaica, Mesopotamia, Greece, Asia minor, Cyprus, Syria, Armenia.

177. (5.) **Sagina** Linn.

Small, matted or tufted herbs, with subulate leaves and small flowers. Sepals 4 or 5. Petals 4 or 5, small, entire or slightly notched, sometimes entirely deficient. Stamens 4 or 5, or twice those numbers. Styles 4 or 5. Capsule opening in as many valves.

A small genus, with nearly the geographical range of *Arenaria*, from which it only differs in the number of styles. The 5-styled species were formerly included in *Spergula*, which is now reduced to one or two species easily distinguished by their apparently whorled foliage.

436. **Sagina apetala** L. Mant. (1762), p. 559. — Boiss. Fl. Or. I, p. 663. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 47 no. 152. — Annual, 2—5 cm high, stems erect branching from the base. Leaves ciliate at the base, rarely glabrous. Sepals ovate, obtuse, unequal, shorter than the capsule; petals minute, lanceolate or 0. — Flow. February to March.

N. d. Without precise locality (Figari).

Also known from Europe, Canaries and Syria.

178. (6.) **Alsine** Wahl.

Sepals 5, entire or retuse, rarely 0. Stamens 10 or fewer, inserted with glands on a somewhat perigynous disk. Styles 3.

Ovary generally many-ovuled. Capsule 3-valved. Seeds kidney-shaped, somewhat laterally compressed, not arillate. — Annual or perennial herbs or shrubs, with small white or pinkish flowers.

A genus of about 75 species, widely distributed, most abundant in temperate or cold climates.

A. Perennials; sepals velvety, nerves 0. 1. **A. procumbens.**

B. Annuals; sepals keeled, 1-nerved 2. **A. picta.**

437. (1.) **Alsine procumbens** Fenzl. ap. Endl. Gener. (1836—1840). p. 965. — Boiss. Fl. Or. I, p. 671. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 47 no. 152. — Sickenberg. Contrib. Fl. d'Eg., p. 185. — Aschers.-Schweinf. Primit. Flor. Marm., p. 597 no. 42. — *Arenaria procumbens* Vahl Symb. I, p. 50 tab. 33. — *Rhodalsine procumbens* J. Gay in Ann. scienc. nat., sér. 3 IV, p. 25 (in adnot.). — Perennial plant, 15–25 cm high, procumbent, glandular-pubescent, rootstock woody; branches prostrate. Cymes irregularly forked; pedicels longer than the calyx, at length declined; leaves fleshy, oblong to linear-oblongate, 3–5 mm long; sepals narrowly white-margined, ovate; pink petals and ovate capsule as long as the calyx. — Flow. March to April.

M. ma. Marmarica: Matruqa; Dakalla; Abusir Alexandria-West and -East; Mandara. — **M. p.** El-'Arish.

Also known from Morocco, Algeria, Tunisia, Tripolitania, Cyrenaica, Western Marmarica, South Europe and Syria.

var. **gracillima** Schweinfurth and Muschler nov. var. — Leaves flaccid, pilose, flowers long-petioled. — Flow. April.

M. ma. Siuf near Alexandria.

Only known from this locality.

438. (2.) **Alsine picta** (Sibth. and Smith) Fenzl Flora (1843), p. 403. var. **sinaica** Boiss. Flor. Or. I (1867), p. 688. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 47 no. 154. — Annual, 5–15 cm high; glandular; densely leafy at the base; stems filiform, erect, dichotomous. Leaves long mucronate. Cymes long-peduncled, diffuse, scarious-bracted; pedicels twice to thrice as long as the calyx, at length reflexed; sepals glabrous, ovate, obtuse, scarious-margined; petals pink, striate, obovate, retuse, once and a half as long as the calyx. — Flow. March to April.

D. a. sept. Galala: Wady Lutt; near „Thebes“ (Figari).

Local name: geleyqela (Schweinfurth).

Also known from Sinai.

179. (7.) *Arenaria* Linn.

Sepals 5. Petals 5, entire or scarcely emarginate, rarely none. Stamens 10. Styles generally 3 (rarely 2—5). Ovary 1-celled, many ovuled. Capsule globose or oblong, dehiscent at the apex by as many valves or teeth as there are styles, or twice as many. Seeds reniform-globose or compressed. — Annual or perennial, mainly tufted herbs, with sessile leaves, and terminal cymose or capitate, rarely axillary and solitary, white flowers.

A large genus of about 150 species, of wide geographic distribution; not common in tropical regions.

439. *Arenaria serpyllifolia* L. Spec. Plant. I (1753), p. 606 var. *glutinosa* Koch in Syn. Flor. von Deutschl. (1838), p. 115. — Boiss. Fl. Or. I, p. 701. — Annual, slender, slightly down pubescent, widely branched and diffuse 2—6 cm high. Leaves ovate, 2—5 mm long, 1—1.5 mm wide, acute; pedicels slender, 2—4 mm long; bracts ovate, resembling the leaves, flowers 2 mm broad or less, very numerous in cymose panicles; sepals ovate, 1.5—2 mm long, acute or mucronate, 3—5-nerved, scarious-margined; petals obovate or oblong, usually shorter; capsule ovoid, slightly shorter than or equalling the calyx, dehiscent by 6 short apical valves; seeds rough. — Flow. February to April.

M. ma. Mariut-Amria (G. Maire).

Also known from North Africa, Nubia, Europe, Asia minor, Armenia, Persia, Turkestan and India.

180. (8.) *Stellaria* Linn.

Sepals 5, rarely 4. Petals the same number, 2-cleft, rarely wanting. Stamens 10 or fewer by abortion, hypogynous. Ovary 1-celled; styles 3, or rarely 2, 4, or 5; ovules few or many. Capsule globose to oblong, few or many-seeded, dehiscing to below the middle in to twice as many valves as styles. Seeds granulate, tuberculate or pitted. — Annual or perennial herbs of very various habit, usually low-growing and diffuse, glabrous or pubescent. Flowers white, solitary or cymose, terminal or lateral.

A genus of about 75 species, dispersed over the whole world, but most abundant in cold and temperate regions.

440. *Stellaria media* (L.) Cyrill. Char. Com. (1784), p. 36. — Boiss. Fl. Or. I, p. 707. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 47 no. 155. — Sickenberg. Contrib. Fl. d'Eg., p. 185. — A weak, much branched annual, glabrous, with the exception of a line of hairs down one side of the stem, and a few long ones on the leafstalks. Leaves small, ovate and pointed, the lower ones stalked and often

heart-shaped, the upper sessile and narrower. Flowers small, on rather long, slender pedicels, in irregularly forked leafy cymes. Petals shorter than the calyx, deeply cleft, with narrow, slightly diverging lobes. Stamens often only 5. Styles 3. — Flow. March to April.

M. ma. N. d. N. f. N. v. O. Everywhere in cultivated and waste places.

Local name: qezâze.

In cultivated and waste places, roadsides, and edges of streams in the Mediterranean basin, throughout Europe and northern Asia, and carried out as a weed to all the temperate and colder regions of the globe.

181. (9.) *Spergula* Linn.

Slender herbs, with narrow-linear leaves in opposite clusters, so as to appear whorled, and minute, scarious stipules. Sepals 5. Petals 5, undivided. Stamens 10, or occasionally 5 or fewer. Styles 5 (in our species 3). Capsule opening in 5 entire valves.

A very small European and Asiatic genus, differing from *Sagina*, as *Spergularia* does from *Arenaria*, by the presence of scarious stipules.

441. ***Spergula flaccida*** Aschers. in Verhandg. d. Bot. Ver. Prov. Brandbg. XXX (1889), p. XXXIV—XLIX. — Murbeck Contrib. Fl. N. O. Afr. I, p. 42. — *Arenaria flaccida* Roxb. Fl. Ind. II, p. 447. — *Spergula pentandra* var. *intermedia* Boiss. Diagn. Plant. Or., sér. 2 fasc. I, p. 93. — Fl. Or. I, p. 731. — *Spergularia fallax* Lowe ap. Hook. Journ. Bot. and Kew. misc. VIII, p. 289. — *Lepigonum eximium* Kindb. Monogr. Lepig., p. 32 tab. II fig. 19. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 47 no. 156. — Sickenberg. Contrib. Fl. d'Eg., p. 186. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 598 no. 43. — Annual, 10—15 cm high, glaucescent. Leaves not grooved beneath. Petals lanceolate, acute; seeds flattened, with a white wing, as broad as the disk, radiate-striate. — Flow. March to April and May.

M. ma. Mariut; Abusir, not rare; Marmarica; Matruqa; Alexandria-West and -East; Mandara; Abukir. — **D. i.** Es-Sâlihiya, not rare; Ramses; Ismailia. — **D. a. sept.** Serapeum, rare; Bir Suez; Suez; Wady Rished; Wady Kherêze.

Local name: Qeleyqela (Sickenberger in Herb. Zürich).

Also known from Madeira, Canary Islands, all the other parts of North Africa, Nubia, Palestine to India.

182. (10.) *Spergularia* Pers.

Sepals 5. Petals 5, entire, rarely wanting. Stamens 10 or fewer by abortion. Ovary 1-celled, many-ovuled; styles 3; Capsules

3-valved, seeds compressed, often winged. — Spreading or prostrate herbs. Leaves linear or setaceous, often with smaller ones fascicled in the axils so as to appear verticillate. Stipules small, scarious. Flowers white or pink, pedicelled, in subracemose cymes.

A genus of 10 or 15 species, widely spread in temperate and subtropical regions, chiefly near the sea-coast or in saline localities.

A. Leaves fleshy, semiterete 1. *S. salina*.

B. Leaves membranous, linear-filiform.

I. Petals as long as the sepals; stamens 5—10.

a) Sepals ovate 2. *S. atheniensis*.

b) Sepals lanceolate.

1. Cymes leafy; seeds wingless 3. *S. campestris*.

2. Cymes leafless, seeds with broad wings 4. *S. media*.

II. Petals shorter than the calyx 5. *S. diandra*.

442. (1.) **Spergularia salina** Prsl. Flor. Sic. (1819). p. 17. — Boiss. Fl. Or. I, p. 733. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 48 no. 160. — Sickenberg. Contrib. Fl. d'Eg., p. 186. — *Arenaria heterosperma* Guss. Syn. I, p. 501. — *Lepigonum salinum* Fries Novit. Fl. suec. Mant. III, p. 34. — *Lepigonum medium* Wahl. Flor. Goth., p. 45. — *Arenaria halophila* Bunge in Ledeb. Flor. Alt. II, p. 162. — Annual or perennial 15—25 cm high, pubescent-glandular; stems prostrate or ascending. Cyme leafy; sepals lanceolate, scarious-margined, usually with a gland at each side of the base; petals obovate, longer than the calyx; stamens 5—10; capsule a little longer than the calyx; seeds smooth, wingless — Spring — Flow. February to April.

M. ma. M. p. N. d. N. f. N. v. O. D. i. D. a. sept. Abundant in saline places.

Also known from the other parts of the Mediterranean region and from Europe.

var. **leiosperma** (Kindb.) Aschers. ex Aschers.-Schweinf. Ill. Fl. d'Eg. (1887), p. 48 no. 160. — *Lepigonum leiospermum* Kindb. Monog. Lepig., p. 23 tab. II fig. 10. — Sickenberg. Contrib. Fl. d'Eg., p. 186. — Seeds smooth.

N. d. Waraq near 'Aïro; Medinet-el-Fayûm; Adwa. — **N. v.** Beni Suêf (Schweinfurth). — **O.** Siwa; Dakhel.

Also known from other parts of the Mediterranean region.

var. **alexandrina** Aschers. in Aschers.-Schweinf. Ill. Fl. d'Eg. (1889), p. 48 no. 160. — Sickenberg. Contrib. Fl. d'Eg., p. 186. — Stems and leaves gracious, flaccid, cymes leafless in the upper part. — Flow. February to March.

M. ma. Alexandria. — **O.** Little Oasis; Great Oasis.

Local name: horrah; gummeyly.

Only known from these localities.

443. (2.) **Spargularia atheniensis** Aschers. in Aschers.-Schweinf. Beitr. Fl. Aethiop. (1867), p. 267 and Aschers.-Schweinf. Ill. Fl. d'Eg. (1889), p. 48 no. 158. — Sickenberg. Contrib. Fl. d'Eg., p. 186. — *Spargularia rubra* var. *atheniensis* Heldr. et Sart. Herb. graec. norm. no. 590. — *Lepigonum campestre* Kindb. Monog. Lepigon., p. 35 tab. 3 fig. 23. — *Spargularia rubra* Boiss. Flor. Or. I, p. 732. — Perennial, glandulous-viscous; stems prostrate; leaves plane; stipules not smooth; cymes densely flowered, aphyllous; peduncles as long as the calyx or shorter; sepals lanceolate, scariously margined; petals obovate as long as the sepals; seeds smooth.

M. ma. Mex. — **N. d.** Merg. — **N. v.** Cairo: Islands of Roda. — **O.** Kharge.

Also known from Algeria, Tunisia, Tripolitania, Cyrenaica, Europe.

444. (3.) **Spargularia campestris** (L.) Aschers. in Flor. Prov. Brandbg. (1864), p. 94. — *Arenaria rubra* and *campestris* L. Spec. Plant. ed. I, p. 606. — Sickenberg. Contrib. Fl. d'Eg., p. 186. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 48 no. 159. — *Spargularia rubra* Presl. l. c. — Boiss. Fl. Or. I, p. 732. — Annual or perennial, 10 to 20 cm high, more or less glandular; stems ascending. Cymes leafy; sepals lanceolate, scariously-margined; petals reddish, obovate, as long as the calyx; stamens 5—10; capsule nearly as long as the calyx; seeds triangular-obovate, wingless, wrinkled, thick-margined. — Flow. February to March.

M. ma. Alexandria; Mandara. — **M. p.** Damietta; El-^cArish. — **N. d.** Tanta; Khanka. — **N. v.** Deyr-et-tîn near old Cairo.

Also known from Europe.

445. (4.) **Spargularia media** Presl. Fl. Sic. (1819), p. 17. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 48 no. 161. — Sickenberg. Contrib. Fl. d'Eg., p. 186. — *S. marginata* Boiss. Fl. Or. I, p. 733. — A rather succulent much branched prostrate or suberect herb, more or less viscid-pubescent; stems 4—12 cm long. Leaves narrow-linear, semiterete, 1—2.5 cm long, fleshy, quite entire, acute; stipules broadly lanceolate, acuminate, conspicuous. Flowers many, axillary and terminal, on slender glandular peduncles 1—2 cm long. Sepals lanceolate, with a broad white membranous border. Petals usually shorter than the sepals. Capsule exceeding the sepals. Seeds more or less flattened, often surrounded by a broad membranous wing. — Flow. March to April.

M. ma. Alexandria. — **M. p.** Rosetta; Damietta. — **O.** Little Oasis.

Also known from Europe.

446. (5.) **Spergularia diandra** (Guss.) Heldr. and Sart. ap. Heldr. Herb. graec. norm. no. 492 (1855). — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 47 no. 157. — Aschers. Flor. Rhinoc., p. 792 no. 47. — Sickenberg. Contrib. Fl. d'Eg., p. 186. — Aschers.-Schweinf. Prim. Flor. Marm., p. 598 no. 44. — *Arenaria diandra* Guss. Prodrum. I (1827) p. 515. — Boiss. Fl. Or. I, p. 733. — *Arenaria salsuginea* Bunge ap. Ledeb. Flor. Alt. II, p. 163. — Annual, 10—15 cm high. glandular, or glabrescent below; stems erect or ascending. Cymes leafless; sepals oblong. scarious-margined; petals red, ovate, somewhat shorter than the calyx; stamens 2—3; capsule somewhat longer than the calyx; seeds triangular-obovate, wingless, roughish, thick-margined. — Flow. March to April.

M. ma. Matruqa; Abusir; Ramle. — **M. p.** Qatiya to El-Arish; Henwa; El-Grady. — **D. l.** Abu-Roash: Between Alexandria and Siwa; Pyramids of Zawiyet-el-Aryân. — **D. a. sept.** Wady Dugla; Wady Hof; Wady Hamata; W. from Ismailia.

Also known from the other parts of the Mediterranean region.

var. **leiosperma** (Bunge) Aschers. and Schweinf. in Ill. Flor. d'Eg. (1887), p. 47 no. 157. — Sickenberg. Contrib. Flor. d'Eg., p. 186. — Boiss. Fl. Or. I, p. 733. — *Lepigonum microspermum* Kindb. Monog. Lepigon., p. 26 tab. 2 fig. 2. — *Spergularia microsperma* Ascherson in Beitr. Flor. Aethiop., p. 267 and 305. — Seeds smooth.

M. ma. Alexandria. — **N. d.** Makhsama near Tell-el-Kebir.

Also known from the other parts of the Mediterranean region.

183. (11.) **Robbairia** Boiss.

Calyx-lobes 5. plano-concave, with narrow, scarious margin. Petals 5, short clawed, limb cordate-ovate. Stamens 5, connate below in a ring around the ovary. Style trifid at the top. Capsule 3-valved. Seeds wedge-shaped, incurved, with grooved back. — Herbs resembling *Polycarpon*.

A small genus of only a few species in the Mediterranean region.

447. **Robbairia prostrata** (Del.) Boiss. Flor. Or. I (1867), p. 735. — *Alsine prostrata* Del. Fl. d'Eg., p. 212 tab. XXIV fig. 4 not Forsk. Flor. aeg.-arab., p. 207. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 48 no. 162. — Sickenberg. Contrib. Flor. d'Eg., p. 186. — *Arenaria prostrata* Ser. in DC. Prodrum. I, p. 400. — *Polycarpaea prostrata* Decsne Flor. Sinaic., p. 39. — Perennial, 20 to 30 cm high, glabrous;

stems numerous, filiform prostrate, stiff-branched. Leaves oblong to linear; stipules and bracts triangular, with scarious margins. Cymes loose, clustered, pedicells as long as the calyx or longer; sepals ovate, obtuse; petals pink, as long as the calyx. — Flow. February to April.

D. l. D. i. D. a. sept. D. a. mer. Abundantly in sandy places.

Local name: hâra; har; hushâr; gileglâg; abad rikhâq; reykhâ.

var. **maior** Ascherson and Schweinf. in Supplem. Ill. Flor. d'Eg. (1889), p. 750. — Sickenberg. Contrib. Flor. d'Eg., p. 186. — All parts very tall. — Flow. March.

D. a. sept. Khanka; Wady Abad; Serapeum; Suez. — **D. l.** Gîza; Abu Roash; Siut. — **D. a. mer.** Aswân.

Also known from Sinai.

var. **minor** Ascherson and Schweinf. in Supplem. Ill. Flor. d'Eg. (1889), p. 750. — Sickenberg. Contrib. Fl. d'Eg., p. 186. — *Polycarpon succulentum* Boiss. Fl. Or. I (1867), p. 736 not J. Gay. — All parts of the plant gracious. — Flow. February to March.

M. ma. Montaza; Mex. — **D. l.** At the edges of Abu Roash up to Thebes — **D. a. sept.** Wady Turra.

Also known from Sinai.

184. (12.) **Polycarpon** Linn.

Calyx parted into 5, keeled, scarious-margined lobes, hooded at apex. Petals 5, obovate to oblong. Stamens 3—5, inserted on a perigynous disk. Style trifid at the top. Capsule 3-valved. Seeds with curved back and straight face. — Herbs with scarious-silvery stipules and bracts.

A small genus of only 6 species, distributed throughout all the warm temperate climates of the world.

A. Stipules and bracts all scarious; bracts embracing the base of the calyx.

I. Leaves oblong-spathulate 1. **P. tetraphyllum.**

II. Leaves ovate 2. **P. alsinefolium.**

III. Leaves linear-oblong 3. **P. arabicum.**

B. Stipules and bracts with green nerve; bracts

shorter than the pedicells 4. **P. succulentum.**

448. (1.) **Polycarpon tetraphyllum** L. Spec. Plant. I (1753), p. 131. — Boiss. Fl. Or. I, p. 735. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 48 no. 163. — Sickenberg. Contrib. Fl. d'Eg., p. 186. — Annual. 10 to 20 cm high. stems many times 2—3-forked, from a diffuse

base. Leaves oblong-spathulate to elliptical, those of the stem 4-ranked, of the branches opposite. Cymes rather loose; pedicels longer than the calyx; sepals ovate, mucronate; petals notched, half as long as the calyx; Stamens 3; style shorter than the ovary. — Flow. March to April.

M. ma. Marmarica; Abusir; Montaza; Alexandria-East and -West; Abukir. — **M. p.** Rosetta; Damietta, in sandy localities. — **N. d.** Rosetta; Cairo. — **N. f.** Medinet-el-Fayûm; Fedimin; Senuris; Tamia. — **N. v.** Kene; Luksor; Aswân. — **O.** Little Oasis; Farâfra; Dakhel.

Also known from all the other parts of the Mediterranean region.

449. (2.) **Polycarpon alsinefolium** (Biv.) DC. Prodrôm. XIII (1828), p. 376. — Boiss. Fl. Or. I, p. 736. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 49 no. 164. — Sickenberg. Contrib. Fl. d'Eg., p. 186. — Aschers.-Schweinf. Prim. Fl. Marm., p. 598 no. 45. — Polycarpon tetraphyllum α alsinefolium Halacs. Consp. Flor. Graec. I, p. 568. — Polycarpon Gmelini Griseb. Spicil. I, p. 214. — Hagea alsinefolium Biv. Manip. III, p. 7. — Procumbent, branched from the base. Leaves subfleshy, opposite, ovate. Flowers in dense cymes; pedicels as long as the calyx; sepals ovate, mucronate; petals oblong twice as long as the calyx, style shorter than the ovary; seeds tuberculate. — Flow. February to March.

M. ma. Marmarica; Omm Rakoum; Matruqa; Abusir; Montaza; Alexandria-East and -West; On road sides everywhere.

Also known from all the other parts of the Mediterranean region.

450. (3.) **Polycarpon arabicum** Boiss. in Diagn. Plant. Or. Ser. I, X (1849), p. 13. — Boiss. Fl. Or. I, p. 736. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 49 no. 165. — Sickenberg. Contrib. Fl. d'Eg., p. 186. — Annual, 2—4 cm high, stems prostrate. Leaves small, fleshy, opposite, linear-oblong. Cymes dense; pedicels as long as the calyx; sepals oblong, obtuse, with broad, scarious margin; petals oblong-linear, as long as the calyx; stamens 5; style twice as long as the ovary. — Flow. February to March.

D. i. Serapeum.

Also known from Sinai and Syria and Arabia Petraea.

451. (4.) **Polycarpon succulentum** (Del.) J. Gay in Duchatr. Rev. II (1846), p. 372 not Boiss. Flor. Or. I (1867), p. 736. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 49 no. 166. — Sickenberg. Contrib. Flor. d'Eg., p. 186. — Alsine succulenta Del. Ill. Flor. d'Eg., p. 211 tab. 24 fig. 11. — Arenaria succulenta Ser. in DC. Prodrôm. I, p. 400. — Annual, 2—10 cm high, stems prostrate. Leaves fleshy, in fours or opposite, oblong-spathulate to linear-oblong, tapering into a petiole.

Cyme loose, few-flowered; pedicels often longer than the calyx; sepals oblong, obtuse, the interior longer; petals oblong-obovate, as long as the calyx; style longer than the ovary. — Flow. February to April.

M. ma. Bîr-Burdân; Abusîr; Montaza; Alexandria-East and -West; Abukîr, rare. — **M. p.** Gels Mohammédiye, Gels; El-'Arish. — **D. l.** Between Alexandria and Siwa; Abu-Roash; Pyramids of Giza; Saqqâra, sandy places. — **D. i.** El-Kantara; Ismailia, in sandy places; El-Ferdân in the highest ground in the Isthmus; El-Qantara. — **D. a. sept.** Bîr Suez; Suez; Cairo, Gebel ahmar.

Also known from Arabia Petraea and Sinai.

185. (13.) *Loefflingia* Linn.

Calyx parted into 5 carinate rigid lobes. Petals 3—5, very small. Stamina 3—5. Style with a capitate or often bilobate stigma. Capsule 3-valved. Seeds ovate. — Annual herbs with the aspect of *Polycnemum*.

A small genus of only 5 species in the Mediterranean region, Asia and Northern America.

452. ***Loefflingia hispanica*** L. Spec. Plant. I (1753), p. 50. — Boiss. Flor. Or. I, p. 738. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 49 no. 170. — Annual, glandulous-viscid; stems slightly erect. Leaves setaceous-subulate; stipules setaceous connate with the leaves. Flowers sessile; petals retuse; stamens 3; style half as long as the ovary. — Flow. March.

M. ma. Abusîr; Mariut; Alexandria-East and -West.

Also known from Cyrenaica, Tripolitania, Tunisia, Algeria, Morocco, Spain, Southern France, Sicily and Asia minor.

186. (14.) *Polycarpia* Lam.

Calyx parted into 5, somewhat flattened, acute, scarious-margined lobes. Petals 5, lanceolate, half as long as calyx. Stamens 5, sometimes with 5 staminoids opposite the petals, all inserted in a perigynous disk; style capitate at the apex or tripartite. Capsule 3-valved; seeds pear-shaped, somewhat incurved. — Herbs or shrubs, resembling *Polycarpon*.

A small genus of about 30 species throughout the tropical and sub-tropical regions of the world.

A. Flowers pedicelled.

I. Leaves shortly lanceolate, acute 1. ***P. repens*.**

II. Leaves ovate-oblong, obtuse 2. ***P. memphitica*.**

B. Flowers sessile 3. ***P. spicata*.**

453. (1.) **Polycarpia repens** (Forsk.) Aschers.-Schweinf. in Oest. Bot. Zeitschr. XXXIX (1889), p. 126. — — *Corrigiola repens* Forsk. Flor. aeg.-arab. Descript., p. 207. — *Polycarpaea fragilis* Del. Ill. Flor. d'Eg., p. 241 tab. 24 fig. 1. — Boiss. Fl. Or. I, p. 737. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 49 no. 167. — Sickenberg. Contrib. Fl. d'Eg., p. 187. — Perennial, 10 to 20 cm high, appressed-crisp-tomentellous; stems herbaceous, prostrate, branching, brittle. Leaves somewhat rigid, opposite or clustered, minute, lanceolate, acutish, with revolute margins. Cymes dense, terminal, paniced; calyx-lobes ovate, with broad, scarious margin. and prominent green nerve, mucronate; style as long as the ovary; stigma capitata: seeds 8—10. — Flow. March to April.

M. p. Quqa; Qatiya. — **N. d.** Islands near Mansura; Khanka; Gezîre; Islands of Roda near Cairo, abundant. — **N. v.** Siut; Gebel Silsile; Kîman. — **D. l.** Abu-Roash. — **D. a. sept.** Suez. — **D. a. mer.** Qoseyr.

Local name: Khirsheyf (Ascherson); gameyleh; abad.: makkir. Also known from Tunisia, Algeria, Arabia Petraea and Asia.

454. (2.) **Polycarpia memphitica** Del. Ill. Flor. d'Eg. (1813), p. 243 tab. 24 fig. 2. — Boiss. Fl. Or. I, p. 737. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 49 no. 168. — Sickenberg. Contrib. Fl. d'Eg., p. 187. — *Alsine prostrata* Forsk. Flor. aeg.-arab. (1775), p. 207. — Annual, 10—15 cm high, velutinous; stems prostrate, herbaceous, branching from the base. Leaves opposite or aggregate, ovate-oblong obtuse, shortly petioled. Cymes terminal, fewflowered; calyx-lobes hairy, linear-subspathulate, concave, obtuse: petals oblong-lanceolate; style very short; stamens recurved; seeds numerous, ovate. — Flow. March to April.

N. d. Islands near Mansura; Khanka; Gezîre; Island of Roda near Cairo, not rare. — **N. v.** Gezîret-ed-dahub; Banks of the Nile near Helwan; Gebel Abu Foda; Esne; Siut; Gebel Silsile; Kîmam.

Local name: Khirshûf.

Also known from the Upper Nile bassni.

455. (3.) **Polycarpia spicata** Wight. Ann. Scienc. Nat. Hist. III (1839), p. 99. — Boiss. Fl. Or. I, p. 738. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 49 no. 169. — Sickenberg. Contrib. Fl. d'Eg., p. 187. — *Polycarpaea staticiformis* Hochst. in Schimp. Plant. Arab. exsicc. — Annual, 5—10 cm high, glabrous; stems filiform, simple or dichotomously branched at the top. Leaves fleshy, glaucous, spathulate-oblong, rosulate at the base of the stem. Flowers sessile, disposed

in spikes; calyx-lobes oblong-lanceolate, acute, scarious; petals very small, two toothed; style very short; stigma short. — Flow. March.

D. a. mer. Mirsa Zebara; Berenice.

Also known from Arabia and N. W. India, Beludshistan.

187. (15.) *Herniaria* Linn.

Calyx of 5 divisions. Stamens 5, alternating with 5 small filaments. Stigmas 2. Seed solitary, in a thin, indehiscent capsule enclosed in the calyx. — Herbs, either annual or with a perennial stock of short duration; with prostrate, much branched, annual stems; opposite leaves; very minute, scarcely visible scarious stipules; and small, green, granular flowers, crowded in little axillary cymes.

A genus of few species, all growing in sandy places, chiefly near the sea, in southern Europe, central Asia, and Africa.

A. Parts of the flowers in fives 1. *H. cinerea*.

B. Parts of the flowers in fours 2. *H. hemistemon*.

456. (1.) ***Herniaria cinerea*** DC. Flor. Franc. V (1815), p. 375. — Boiss. Fl. Or. I, p. 739. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 49 no. 170. — Ascherson-Schweinf. Prim. Flor. Marm., p. 598 no. 46. — *Herniaria annua* Lag. Gen. et Spec., p. 12. — Annual, 10 to 15 cm high, ash-coloured, hirsute; stems thick, ascending. Leaves oblong-linear. Flowers sessile, 7—10 in crowded clusters; calyx-lobes oblong, beset with bristles of equal length, nearly as long as the breadth of the sepals; styles short, distinct. — Flow. February to April.

M. ma. Marmarica; Matruqa; Abusîr; Alexandria-West and -East: Mandara; Abukîr; Sterile fields and roadsides; even in the desert.

Also known from all the other parts of the Mediterranean region.

457. (2.) ***Herniaria hemistemon*** J. Gay ap. Duchartre Rev. Bot. II (1846—1847), p. 371. — Boiss. Fl. Or. I, p. 742. — Ascherson-Schweinf. Ill. Fl. d'Eg., p. 49 no. 171. — Sickenberg. Contrib. Fl. d'Eg., p. 187. — Aschers.-Schweinf. Prim. Flor. Marm., p. 598 no. 47. — *Herniaria fruticosa* var. *hemistemon* Barratte ap. Bonm. and Barratte in Cat. Plant. Tun., p. 65. — *Herniaria fruticosa* Cosson in Bull. Soc. Bot. Franc. XXXVI, p. 94 not Linn. — Perennial, 5—10 cm high, velvety, densely tufted; stems brittle, filiform. Leaves oblong; stipules brown. Flowers sessile, glomerate-spiked; calyx-tube hispid, the outer two lobes herbaceous, fleshy, deltoid-spathulate, fourtimes as long as the ovate, membranous inner pair; styles 2, long, free from the base. — Flow. February to March.

M. ma. Marmarica; Matruqa; Ras-el-Kenaïs; Abusir; Alexandria-East and -West; Abukir. — **M. p.** El-'Arish. — **D. a. sept.** Between Khanka and Birket-el-Hagg; Wady Dugla; Wady-el-Hof; Wady Rished; Southern Galala, on calcareous ground. — **O.** Siwa.

Local name: Umm-Libbaida (Muschler).

Also known from Tunisia, Tripolitania, Fezzan, Western Marmarica, Arabia Petraea, Palestine and Persia.

188. (16.) *Paronychia* Tourn.

Calyx 5-parted, the segments bristle-pointed. Stamens 5, inserted at the base of the calyx sometimes alternate with as many staminodia. Ovary ovoid or subglobose, narrowed upward into the style; style 2-cleft at the apex; ovule solitary, amphitropous. Utricle membranous, included in the calyx, 1-seeded. — Perennial, tufted herbs, often woody at the base, with opposite leaves, scarious stipules, and small clustered scarious-bracted apetalous flowers.

A genus of about 40 species, natives of warm and temperate regions.

A. Calyx-lobes herbaceous, not hooded at the apex, plano-concave.

I. Calyx lobes equal 1. *P. capitata*.

II. Calyx lobes unequal 2. *P. sinaica*.

B. Calyx-lobes semi-scarious, hooded, mucronate on the back near the apex.

I. Perennial. Heads 1 cm broad 3. *P. argentea*.

II. Annual. Heads 3 mm broad or less.

a) Puberulent; bracts oblong, acute 4. *P. arabica*.

b) Velvety canescent; bracts ovate 5. *P. lenticulata*.

458. (1.) *Paronychia capitata* Lam. Flor. Franç. III (1778), p. 229. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 49 no. 173. — Sickenberg. Contrib. Fl. d'Eg., p. 187. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 598 no. 48. — *Illecebrum capitatum* L. Spec. Plant. I, p. 299. — *Paronychia nivea* DC. ap. Lam. Encyclop. V, p. 25. — Boiss. Fl. Or. I, p. 743. — *Paronychia Koehiana* Boiss. Diagnos. Plant. Orient. Ser. I, fasc. X p. 13. — *Paronychia serpyllifolia* Griseb. Spicil. I, p. 214. — Perennial, 10+15 cm high, often thubby at the base; branches rather long, ascending or prostrate. Leaves ovate to oblong, 3–5 mm long, rather obtuse, appressed-puberulent. Heads 1.5 cm broad; bracts large, round-ovate, acute or obtuse, mucronate, calyx-lobes hairy, oblong-linear. — Flow. April to June.

M. ma. Marmarica; Mariut; Matruqa; Abusir; Montaza; Alexandria, in sandy places. — **D. i.** Desert el-Tih.

Throughout the Mediterranean region.

459. (2.) **Paronychia sinaica** Fresen. Beitr. Flor. Abyss. (1837), p. 180. — Boiss. Fl. Or. I, p. 744. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 49 no. 174. — Sickenberg. Contrib. Fl. d'Eg., p. 187. — Perennial, 3—10 cm high, shrubby at the base, with ascending branches. Leaves oblong-linear, 2—3 mm long, obtuse or acutish. Heads 5—10 mm broad; bracts orbicular, acuminate or mucous; lobes of the hairy calyx minute, keeled, oblong-linear, acute, very unequal. Flow. February to May.

D. a. sept. Wady Abu Sateri; Northern Galala; Wady Ghizli; Wady Omm Ruthi; Southern Galala, everywhere on calcareous ground. Also known from Sinai.

460. (3.) **Paronychia argentea** Lam. Flor. Franç. III (1778), p. 230. — Boiss. Fl. Or. I, p. 745. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 49 no. 175. — Sickenberg. Contrib. Flor. d'Eg., p. 187. — Aschers. Flor. Rhinocol., p. 792 no. 57. — Illecebrum Paronychia L. Spec. Plant. I, p. 299. — Perennial, 30—50 cm high, prostrate, diffuse. Leaves glabrous, obovate to oblong and lanceolate, acute. Heads lateral and terminal, dense, intermixed with leaves; bracts ovate, acute, much longer than the flower; calyx-lobes oblong, margin narrower than the herbaceous portion. — Flow. February to June.

M. ma. Alexandria. — **D. i.** Between Alexandria and Siwa. — **D. i.** Sheyk Zoyed; Gebel Ekhfên; Gebel Neby Gehâm.

Also known from all the other parts of the Mediterranean region.

461. (4.) **Paronychia arabica** DC. Catal. Mouspel. (1813), p. 130. — Boiss. Fl. Or. I, p. 746. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 49 no. 176. — Sickenberg. Contrib. Fl. d'Eg., p. 187. — Aschers. Flor. Rhinocol., p. 792 no. 52. — Aschers.-Schweinf. Primit. Flor. Marm., p. 598 no. 49. — Paronychia longiseta Webb. Phyt. Canar. I (1836), p. 163 in adnot. — Annual, 10—30 cm high, puberulent; branches filiform, prostrate, sparingly leafy. Leaves oblong to lenticular 3—6 mm long, mucronate. Heads numerous, few flowered, along the lateral and terminal branches; bracts oblong-lanceolate, acuminate, equalling or over-topping the flowers; scarious margin of the calyx-lobes much broader than the herbaceous part; awn as long as lobe. — Flow. May.

M. ma. Abusîr; Marmarica; Montaza; Mex; Matruqa; Alexandria-West and -East. — **M. p.** Rosetta; Damietta on sandy hills and on calcareous ground; Brullus; El-'Arish. — **O.** Dakhel.

Local name: nukhâla (Brullus); nekhâlâh (El-'Arish-Ascherson).

Also known from Tunisia, Algeria, Morocco, Palestine and Arabia Petracca.

462. (5.) **Paronychia lenticulata** (Forsk.) Aschers. and Schweinf. in Oester. Bot. Ztschrft. (1889), p. 128. — *Herniaria lenticulata* Forsk. Flor. aeg.-arab. (1775), p. 52, 53. — *Paronychia desertorum* Boiss. Diagnos. Plant. Orient., Ser. I fasc. III, 2 (1843), p. 11. — Boiss. Flor. Or. I, p. 746. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 49 no. 177. — Sickenberg. Contrib. Flor. d'Eg., p. 187. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 598 no. 49. — *Paronychia arabica* δ desertorum Durand and Barrat in Prodrum. Flor. Libye. (1910), p. 44. — Annual, 10—20 cm high, velvety-canescens, diffuse. Leaves and stipules densely imbricated below, the leaves oblong-lanceolate, mucronate. Heads few-flowered, disposed in elongated, narrow panicles; bracts ovate, acute, somewhat longer than the flowers; scarious margin of calyx-lobes somewhat broader than the herbaceous part; mucro short. — Flow. April and May.

N. d. Alexandria, margin of cultivated land; Damanhur; Mansura; Zaqaziq; Cairo. — **O.** Siwa; Little Oasis; Farâfra, abundant; Dakhel, not rare; Great Oasis, abundant. — **D. i.** Wady Natrûn; Kafr Hakim; Abu Roash; Pyramids of Giza; Pyramids of Zâwiyet-el-'Aryân. — **D. i.** Es-Sâlibiya, in sandy places, abundant; Ramses; Ismailia; Atabet el Gisir. — **D. a. sept.** Helwan; Mas'ara; Wady Abu Shusha; Wady Rished.

Local name: sha'arân (Wilkinson).

Also known from Tripolitania, Arabia Petraea and Persia.

189. (17.) **Gymnocarpus** Forsk.

Calyx herbaceous, urn-shaped at the base, the 5 lobes somewhat hooded at the top, apiculate at the back, at length indurated. Petals 5, setaceous. Stamens 5, inserted at throat of the calyx, opposite its lobes. Style elongated, stigmas 3, short, filiform. Ovary sessile, ovule pendulous from the apex of the basilar funicle, free, compressed. Utricle membranous, indehiscent, at length ruptured at the base. Embryo horse-shoe-shaped; radicle superior. — A *Salsola*-like, branching shrub, with opposite leaves, flowers in capitate, short-peduncled, axillary or terminal cymes.

A small genus of only one species, distributed from Arabia and India to the Canarian Islands.

463. **Gymnocarpus decander** Forsk. Flor. aeg.-arab. (1775), p. 65 tab. X. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 49 no. 178. — Sickenberg. Contrib. Fl. d'Eg., p. 187. — Aschers.-Schweinf. Prim. Flor. Marmar., p. 598 no. 50. — Aschers.-Florul. Rhinoc., p. 792 no. 53. — Ascherson Flor. Sirbon., p. 811 no. 3. — *Gymnocarpus fruticosus* Pers. Syn. I (1805), p. 262. — Boiss. Fl. Or. I, p. 748. —

Trianthema fruticosa Vahl Symb. I, p. 32. — Perennial, 10—30 cm high, dark greyish white; branches zigzag, with short nodes. Leaves oblong-linear, terete, mucronulate; stipules triangular, short. Bracts lanceolate, much shorter than the calyx; calyx-tube pruinose; lobes linear, reddish, with scarious margins. — Flow. February to May.

M. ma. Mariut; Marmarica; Matruqa; Abusîr; Alexandria-West and -East; Mandara; Abukîr. — **M. p.** In sandy places Rosetta; Damietta, abundantly; Between Qatîya and El-^cArish. — **D. i.** Desert near Medinet-el-Fayûm; Siwa; Abu Roash; Pyramids of Gîza; Pyramids of Saqqâra; Dashur. — **D. i.** El-Qaraîm; Es-Sâlihîya; El-Ferdân; Ismailia; Ramses, not rare; Gebel Ekhfên, Abu Hamrâ. — **D. a. sept.** Gebel Turra; Gebel ahmar; Basatin; Wady Mîr; Wady Dakhel; Moqattam, rare; Wady Dugla; Wady Hof; Helwân, not abundant.

Local name: sirr (Forskål); fasheysh (Schweinf.); generally; djerad; garad.

Also known from Western Marmarica, Cyrenaica, Tripolitania, Tunisia, Algeria, Morocco, Canary Islands; Arabia Petraea, Palestine, Syria, Persia and Beludshistan.

190. (18.) *Sclerocephalus* Boiss.

Calyx cup-shaped at the base, united with the floral leaves and bracts, the 5 lobes erect, somewhat hooded, spiny below their tip. Petals 0. Stamens 5, inserted at the margin of the membranous disk of the calyx which lines its tube, opposite its teeth; filaments thread-like, very short; anthers ovate-globular. Ovary membranous, adnate below to calyx-tube, free at the top. Style bifid, with somewhat recurved, stigmatose branches. Ovule suspended from a flat, membranous-margined, basilar funicle. Utricle irregularly torn at the apex. Seed ovate, somewhat compressed; embryo annular; radicle superior. — Annual, prostrate herbs, with spherical, 4—7-flowered heads, in fruit concreted with the spiny, indurated, echinate, floral leaves, and deciduous with their short, jointed peduncle.

A small genus of only one species from Persia to the Canary Islands.

464. *Sclerocephalus arabicus* Boiss. Diagn. Plant. Orient., Ser. I fasc. III (1843), p. 12. — Boiss. Fl. Or. I, p. 748. — *Paronychia sclerocephala* Decaisne Flor. Sinaic., p. 38. — Annual, 2—10 cm high. Leaves linear-terete, mucronate; stipules scarious, very acute. Floral leaves somewhat longer than the calyx; bracts acute, membranous, shorter than the calyx; calyx-teeth straight, convex at the back, crisp-woolly. — Flow. February to April.

D. a. sept. (or **R.?**) Without precise locality collected by Figari Bey (in Herb. Firenze).

Also known from Persia to the Canary Islands.

191. (19.) *Pteranthus* Forsk.

Calyx closed, 4-parted into straight, oblong-linear lobes, hooded and tipped with a vertical, scarious-margined, spiny appendage, the external much broader, more keeled. Petals 0. Stamens 4, opposite the calyx-lobes, connate at the base in a cup; anthers ovate. Ovule 1, erect, from the base of the ovary. Stigma bifid. Utricle indehiscent. Seed compressed. — Annual, fleshy herbs, with three-branched cymes, borne on a common peduncle, which becomes dilated, leaf-like in fruit, and falls off with the cyme; the central branch one-flowered, the lateral ones apparently pinnatipartite, sterile.

A small genus of only one species, widely distributed in Northern Africa, Malta and Western Asia.

465. *Pteranthus dichotomus* Forsk. Flor. aeg.-arab. (1775), p. LXII. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 49 no. 79. — Boiss. Fl. Or. I, p. 752. — *Pteranthus echinatus* Desf. Fl. Atl. I (1798), p. 144. — *Camphorosma Pteranthus* Sibth. et Smith Flor. graec., tab. 153. — Annual, 10—30 cm high, stems 2—3-chotomously branched, ascending or procumbent. Leaves linear, fleshy. Cymes disposed in a corymbose, leafy panicle, papillose-hairy; lobes of the sterile branches of the cyme imbricated, hooked at the tip. — Flow. March to May.

M. ma. Mariut; Abusir; Bîr-Burdân; Alexandria-East and -West; Mandara; Abukîr. — **D. l.** Es-Sabrigât; Kafr Hakim; Abu Roash, on calcareous ground, Pyramids of Giza. — **D. i.** Es-Sâlibîya, in sandy localities; Ismailia; Ramses. — **D. a. sept.** Wady Rished; Gebel ahmar; between Gebel ahmar and petrified forest; Wady Azkhar; Wady Waraq; Belbês, in sandy places; El-Abassiya; Moqattam; Wady Dugla; Wady Hof; Helwân. — **D. a. mer.** Wady Gadire.

Local name: Basûma.

Also known from the other regions of Northern Africa and from Western Asia.

192. (20.) *Cometes* Burm.

Calyx closed, with 5, straight, rather concave lobes. Petals (or sterile filaments) 5, strap-shaped, adnate to the stamiferous cup. Stamens 5, opposite the calyx-lobes, the base united into a

cup; anthers oblong. Ovule 1, erect. Style filiform, exserted, trifid at the apex, with stigmatose branches. Utricle indehiscent. Seed oblong, compressed. — Annual herbs. more or less scabrous, with subulate stipules, erect, 2—3-chotomous stems, and three-branched cymes, on an unchanged petiole, which falls with the cyme at maturity; the central branch 1-flowered, the lateral one sterile, multipartite into pinnatipartite, plumose, rust-coloured bristles, which grown longer in fruit.

A small genus of only one species, widely distributed in Northern and Southern Africa and Western Asia.

466. **Cometes abyssinica** R. Br. in Wall. Plant. Asiat. rar. (1830 to 1832), tab. 18. — Boiss. Flor. Or. I, p. 753. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 49 no. 185. — *Ceratonychia nidus* Edgew. Journ. Beng. XVI, p. 1215. — *Cometes suratensis* Burm. Flor. Ind., p. 39. — *Cometes apiculata* Decsne. Florul. sinaic., p. 6. — Annual more or less scabrous-papillose, with branching hairs. Leaves linear-lanceolate, mucronate. Calyx-lobes oblong, hooded at the apex, mucronate; petals longer than the filaments. — Flow. March to April.

D. a. sept. Wady Dugla; Kene, on calcarious ground; Luksor; Esne; Asswân. — **D. a. mer.** Qoseyr.

Also known from Western Asia and from South Africa.

Ranales.

Herbs, shrubs or trees. Leaves normal, sometimes of 2 forms on aquatic plants: blades simple or sometimes variously cut. Flowers perfect, monoecious or dioecious, variously disposed. Calyx and corolla of distinct and separate members. Androecium of usually hypogynous stamens, which are mostly more numerous than the sepals. Gynoecium of 1 or mostly several, distinct or rarely more or less united, carpels. Ovary often superior. Fruit various.

33. Nymphaeaceae.

Flowers bisexual, of large size. Sepals 4—5, separate or united at the base, free, or adhering to the fleshy receptacle (torus) which surrounds the ovary. Petals numerous, in several rows, the inner ones narrower and shorter, gradually assuming the appearance of stamens. Stamens inserted within the petals, indefinite, in several rows; filaments flat and petaloid; anthers adhering to the face of the filament, two celled, opening longitudinally inwards. Carpels numerous, immersed in the fleshy receptacle, and thus united into a plurilocular ovary, crowned with radiating sessile, linear stigmas,

alternating with the dissepiments. Ovules very numerous, anatropal, affixed to both surfaces of the dissepiments. Fruit baccate, many celled, indehiscent. Seeds with much flowery albumen, and a minute embryo, lodged within a proper sac, near the base of the seed.

Water plants with prostrate, rooting and rootlike submerged stem, and floating cordate or peltate leaves, on long footstalks.

These plants are commonly known as Water-lilies, and species occur throughout the temperate and tropical zones of both hemispheres. Of the five genera known to botanists three are tropical and two belong to the temperate zone. The giant Waterlily of South America (*Victoria Regia*) has peltate leaves, 2 m in diameter, so admirably buoyed up by a system of ribs and veins of peculiar structure that each leaf is capable of supporting on the surface of the water the weight of a full-grown man. The seeds of all the Order are edible, containing much fecula. The rootstocks are astringent, and have been used for tanning leather. The flowers of all are remarkably handsome, and of many are sweetly scented.

191. *Nymphaea* Linn.

Sepals 4 (rarely 3 or 5), inferior. Petals many, 12—40, multiseriate, the lowest alternate with the sepals. Stamens many (20—700), multiseriate, inserted above the petals on the upraised torus which surrounds the carpels; outer filaments broader, often petaloid; innermost slender or filiform; anthers introrse, bilocular. Carpels many, 8—35, snuk in the cupshaped, fleshy receptacle, fused dorsally with it, and produced above it into shorter or longer processes, the carpellary styles; margins of carpels fused centrally with the floral axis, which extends above them as a short axille process. Stigma broad, concave radiate. Ovules very many, anatropous, pendulous from the walls of the ovary cells. Fruit a spongy berry, ripening under water and bursting irregularly. Seeds with a floating sac-like aril, open at the top; endosperm very small; perisperm copious. Embryo small, straight. — Aquatic herbs with perennial elongated or tuberous rhizome, rooting in mud at the bottom of ponds, streams, etc.; leaves floating ovate to orbicular, fissicordate, 5—60 cm in diameter; flowers solitary, showy, floating or raised above the water on stiff scapes, 2.5—30 cm in diameter, white, blue, red, or yellow, in all shades.

Natives of the temperate zones, rare within the tropics.

A. Connectiv of the anthers not elongate; sepals obtuse 1. *N. Lotus*.

B. Connectiv of the anthers elongated; sepals acute . . 2. *N. coerulea*.

467. (1.) *Nymphaea Lotus* L. Spec. Plant. I (1753), p. 511.
— Boiss. Fl. Or. I, p. 104. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 36

no. 18. — Conard, Waterlilies, p. 194. — Henkel and Dittmann, Nymphaeaceen, p. 69 (incl. *N. thermalis* DC. and *N. dentata* Planch.). — Gilg in Engl. Bot. Jahrb. XLI (1908), p. 366. — *Nymphaea thermalis* DC. Syst. Nat. II, p. 54. — Tuber from seedling plant ovoid, roughened with small scattered leaf-scars below, tapering to a point at the vegetative end, which is surrounded by long hairs. Leaf of mature plant distinctly peltate (2—5 cm), 20—50 cm in diameter, subspinose-dentate and more or less wavy at margin, the teeth being sharp and brown-tipped, situated on the crests of the vertical undulations of the margin, 1.3—5 cm apart, with curved sinuses. Texture very firm and stiff by reason of the large prominent veins of the under surface; upper surface of the leaves dark green and shining; under surface greenish or dull purplish-brown, puberulent or rarely glabrous. Flowers 15—25 cm. Across, open on 4 successive nights from 7.30 p. m. to 11 a. m., the sepals and petals all standing out horizontally, and stamens all erect, nearly odourless; stamens about half as long as the petals, yellow; outer ones with broad, persistent filament having a lunate semi-decurrent insertion on the torus; inner filaments slightly wider than the anthers; ovary finely pubescent. Carpels about 30; styles yellow, tinged purplish-brown on the back, becoming incurved over the stigma in fruit; stigma funnel-shaped; fruit large, 6—9 cm in diameter, with copious seeds; seeds 1.36 mm by 1.07 mm to 1.44 mm by 1.09 mm, with interrupted longitudinal lines of hairs, aril inclosing the seed. — Flow. December to March.

N. d. Rosetta; Damietta; Damanhur; Fûa; Kafr-ez-Zayyât; Zifta; Mansura, everywhere in ditches. — **N. f.** Environs of Medinet-el-Fayûm.

Also known from Central and West Africa; Senegambia, Guinea, Madagascar, Hungary. — *Nymphaea thermalis* DC. was separated from *Nymphaea Lotus* L. chiefly for geographical reasons, and named on account of its habitat, namely, the hot springs of Grosswardein and Kaisersbad in Hungary. It has petals approaching in shape those of *Nymphaea dentata* Schum. & Thonning, and is figured by Reichenbach (1845) as of a white colour tinged with purplish. Specimens of *Nymphaea thermalis* from the "locus classicus" seen in Berlin show a peculiar venation of the leaf. In the *Lotus* group generally there is no plain demarcation of the primary areas of the network of veins; but in the plants referred to these areas were sharply marked off by short transverse veins about half way between the center and margin of the leaf. We would not care to separate the two forms, even as varieties, without further acquaintance with living plants direct from the classic localities (cf. Conard, Waterlilies, p. 197).

468. (2.) ***Nymphaea coerulea*** Savigny in Ann. Mus. Paris. I (1802), p. 366. — Boiss. Fl. Or. I, p. 104. — Aschers.-Schweinf.

Ill. Fl. d'Eg., p. 36 no. 19. — Conard, Waterlilies, p. 141. — Gilg in Engler's Bot. Jahrb. XLI, p. 361. — *Nymphaea coerulea* var. *albiflora* Casp. nescr. — Leaves entire or slightly wavy at the base, orbicular or ovate-orbicular, insertion of the petiole close to the margin of the leaf; becoming 30—40 cm in diameter; green above; under surface green with small dark purple spots, purplish all round near the margin. Flowers 7—15 cm across, open from 7.30 a. m. to 12 m Buds conical. Sepals thickly marped with black lines and dots. Petals 14—20, lanceolate, light blue above, lower half dull white. Stamens 50—73; appendage long, 0.5 cm on outermost stamens, slender, pale blue. — Flow. December to March.

N. d. N. f. O. In ditches and canals, often abundantly.

var. **genuina** Gilg and Muschler in Engler's Botan. Jahrb. XLI (1908), p. 362. — Leaves very thin; purplish on the under surface with blue spots; the sinus acute. Flowers 10 cm in diameter or more (17 cm); sepals spotted or rarely unspotted, as long as the petals, thin; petals coeruleous, rarely whitish (var. *albiflora* Casp.!); stamens 50—70.

N. d. Rosetta, in ditches and rice-fields; Damietta; Canals near Kafr Dowar; Benha el Assal; Abu-el-Akhdar.

Only known from these localities.

var. **hypocyanea** Gilg and Muschler in Engler's Bot. Jahrb. XLI (1908), p. 362. — Leaves very thin; upper surface slightly green, glabrous; under surface dull blue; nerves brownish-coloured; sinus acute at their basis. Flower 7—9 cm in diameter, white; sepals thin, darkly spotted; petals mostly shorter than the sepals; stamens 30—40. — Flow. October to April.

N. d. Rosetta (Muschler); Kafr-el-Zayyat (Schweinfurth). — **N. f.** Medînet-el-Fayûm (Muschler).

Only seen from these localities. *Nymphaea coerulea* β *albiflora* Sickenberg. in Contrib. Flor. d'Eg., p. 173 from Qaliub (**N. d.**) is probably the same form.

var. **Aschersoniana** Gilg and Muschler in Engler's Bot. Jahrb. XLI (1908), p. 362. — Leaves thick; on both sides without spots; nerves subprominent on the under surface; sinusses shortly acute at their base. Flowers blue, usually 10 cm in diameter; sepals thickly coriaceous, without spots, longer than the petals; stamens 50—70. — Flow. April.

O. Little Oasis; Ain Bishnîn; Ain Auidâd near Bawiti.

Only known from these localities.

The name of this species has had a varied application. The cause lies partly in the close resemblance of *N. coerulea* and *N. stellata*, and partly in

the fact that these and *N. capensis* were introduced into cultivation near the same time, and the descriptive character of the name *coerulea* made it equally applicable to it. The geographical proximity of this and *N. capensis* may have added to the confusion.

In Egypt the relations of the waterlilies to the social and religious life were very extended. The teachings of archeological research were brought together long ago by Duppa (1813—1826), and to some extent by Tratinick (1822), and more recently by Dr. Pleyte (1875), where as the critical observations of Schweinfurth from 1882—1886 have added many interesting facts, and placed many points beyond the reach of doubt. In spite of a complete unanimity among scholars, considerable confusion exists in the popular mind as to the identity of the so called Sacred Lotus of Egypt. Often *Nelumbo nucifera* is commonly styled Sacred or Egyptian Lotus. But Pickering, Pleyte, Joret and Schweinfurth from the botanical side, and Wilkinson, Erman and Borchardt, as least, among archaeologists, unite in the opinion that *Nelumbo nucifera* is never found on the ancient monuments, and that it was not known in Egypt before the advent of the Persians. Not until the Roman period did it find a place in Egyptian art; it does become more or less prominent at this time. But this comes within the limit of recorded history. We must understand, therefore, that the "Lotus" of the palmy days when Egypt was truly Egyptian was a waterlily native to the Nile Valley and Delta. Two species are figured on the monuments and tombs, *Nymphaea Lotus*, the white night-lotus, and *Nymphaea coerulea*, the blue diurnal one; of these the latter occurs very much more frequently. Pleyte found the white lotus only on a single tomb, belonging to the XII dynasty, about 2500 B. C. (following Petrie's dates!). Schweinfurth found petals of the white lotus along with those of the blue in the funeral wreaths of Ramses II and Amenhotep I, but he never observed any carvings or pictures of this plant.

Since the leaves of the blue species are entire and its petals acute, whereas the white one has sharply dentate leaves and broad petals rounded at the apex, the difference is usually evident even in very crude representations. We recognize the blue one easily in manifold applications. It occurs, according to Schweinfurth, on all the ancient monuments of Egypt. The use of its tuberous rhizome for food, is said to have been given to the people by Menes, or perhaps even by Isis (Diodorus; Pickering). At convivial meetings a flower of the blue lotus was presented to each of the guests, and in feasts for the dead, the feasters delighted themselves with the color and odor of this lotus (Buckley). In a carving figured by Wilkinson, the guests are distinguished from the hosts and servants partly by their lotuses.

The use of flowers in funeral decorations seems to have been very prominent in the XIX—XXI dynasties. The custom was to lay wreaths and semicircles of flowers on the breast of the enwrapped corpse until the sarcophagus was quite packed with these floral tributes. Flowers of *Nymphaea coerulea* on petioles 36—50 cm were fastened between the bands

encircling the mummies of Ramses II and the priest Nisboni, scattered singly all over them. Breastwreaths consisting mostly of petals and sepals of the same plant, sometimes also with petals of *N. lotus*, were found in the coffins of Ramses II, Amenhotep I, Ahmes I (1580 B. C.), the priest Nisboni, the princess Nzi-Khonsu, and the mummy of the case marked Kent, from the XX and XXI dynasties, found at Deir-el-Bahari (Thebes) in July 1881. These are probably the "Egyptian wreaths" of Pliny and Plutarch, the "lotus garlands" of Athenaeus. Most of these plant-remains date from nearly 2000 B. C., but those of Ramses II were renewed about 1100 B. C.; for in moving these sarcophagi at that time into their secret resting-place in the Valley of the Tombs of the Kings, to avoid the marauding hordes from the desert, that of Ramses was accidentally broken; a new coffin and new floral decorations were therefore supplied.

So it appears that the lotus was enjoyed in many ways, but especially as an ornament, a thing of beauty. It was the emblem of the Nile God, for it was the evident product of the river. It was offered to Osiris as any treasured object is consigned to the gods. It was laid upon the bodies of the dead, but other plants could take its place at seasons of the year when the lotus was out of bloom. Thus we see no decided evidence that it was a sacred flower, or an object of worship. It was the "favorite flower in the hands of the Egyptians" (Wilkinson) as the rose or others might be in the hands of any modern people (cf. Conard's the Waterlilies, p. 7—12).

34. Ceratophyllaceae.

Submerged aquatics, with slender widely branching stems, and verticillate leaves, the monoecious or dioecious flowers solitary and sessile in the axils. Perianth many-parted, the segments entire or toothed. Stamens numerous, crowded on a flat or convex receptacle; anthers sessile or nearly so, linear-oblong, extrorse, the connective prolonged into a thick appendage beyond the sacs. Pistillate flowers with a superior 1-celled ovary; ovule 1, orthotropous, pendulous; style filiform, stigmatic at the summit. Fruit an indehiscent nut or achene. Endosperme none; embryo composed of 4 verticillate cotyledons, with a short hypocotyl and a plumule of several nodes and leaves.

The family contains only the following genus.

192. *Ceratophyllum* Linn.

Sterile flowers with 10—20 stamens, the anthers about as long as the perianth. Fertile and sterile flowers generally at different nodes, but sometimes in opposite axils at the same node. Ovary and fruit somewhat longer than the perianth the fruit beaked with

the long persistent style. Leaves crowded in verticils, linear or filiform, spinulose-serrulate, forked.

One or possibly two species, widely distributed in fresh water.

469. *Ceratophyllum demersum* L. Spec. Plant. I (1753), p. 992. — Boiss. Fl. Or. IV, p. 1202. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 76 no. 439. — Stems 20—80 cm long, according to the depth of the water. Leaves in verticils of 15—24 mm, linear, 2—3-times forked, the end of the segments capillary and rigid, 4—12 mm long; ripe fruit oval, 2—3—5 mm long with a straight or curved spine-like beak 2—4 mm long, smooth and spurless or with a long basal spur on each side, or tuberculate and with narrowly winged spiny margins or broadly winged without spines. — Flow. March.

N. d. Damanhur; Rosetta, ditches near the rail-way, abundant; Damietta; Zaqaziq; East of Abu-el-achdar; Ramses; Ismailia; Serapeum; Suez.

Local name: hamûl.

In sponds and streams throughout the temperate and warmer zones of the world. — Several species and varieties have been proposed, based on the spurs, spines or wings of the fruit, but none of them seem to be of any value.

35. **Ranunculaceae.**

Annual or perennial herbs, rarely shrubs or woody climbers. Leaves all radical or alternate, seldom opposite (*Clematis*). Stipules wanting, or adnate to the petiole. Flowers regular or irregular, bisexual or more rarely unisexual. Sepals 3 or more, often 5; deciduous, often petaloid imbricate (valvate in *Clematis*). Petals the same number as the sepals or more, hypogynous, free, imbricate, sometimes transformed in nectaries or wanting. Stamens hypogynous, usually very numerous; anthers adnate. Carpels generally many, free, 1-celled; ovules one or several, attached to the ventral suture, anatropous. Fruit of numerous 1-seeded indehiscent achenes or many-seeded follicles, rarely a berry. Seeds small; embryo minute, at the base of the copious albumen.

A large order, most abundant in temperate regions; rare within the tropics. Genera 30; species about 600. Most of the species are acrid, and many are poisonous, *Aconite* and *Hellebore* being familiar examples. All the Egyptian genera are widely distributed in temperate climates.

A. Carpels 1-ovuled.

I. Climbing plants with opposite leaves 1. **Clematis**.

II. Herbaceous plants.

a) Sepals coloured. Petals none 2. **Anemone**.

b) Sepals green. Petals present.

1. Blads of the petals with a nectariferous
pit at the base 3. **Ranunculus.**
 2. Blads of the petals without a nectariferous
pit at the base 4. **Adonis.**
- B. Carpels many ovuled.
- I. Flowers regular 5. **Nigella.**
 - II. Flowers irregular 6. **Delphinium.**

193. (1.) **Clematis** Linn.

Flowers in few- or many-flowered axillary panicles, dioecious or monoecious. Sepals 4—8, petaloid, valvate in the bud. Petals wanting. Stamens many. Carpels numerous, each with one pendulous ovule. Fruit a head of sessile achenes, mostly produced into long feathery persistent styles. — Climbing shrubs with slender flexuous branches, rarely dwarf and prostrate. Leaves opposite, usually ternately divided into 3 stalked leaflets, which are either entire or more often variously lobed or cut; petioles often twining.

A genus of over 100 species found in most temperate climates, rare in the tropics.

470. **Clematis flammula** L. Spec. Plant. I (1753), p. 644. — Sickenberg. Contrib. Fl. d'Eg., p. 171. — Boiss. Fl. Or. I, p. 4. — Leaves when young pubescent afterwards smooth, bipinnate; segments ovate or oblong, entire or 3-lobed, slightly oblique. Sepals oblong, obtuse, white. Achenes pubescent, with prominent margin. — Flow. January.

N. d. Hedges and small thickets near Zaqaziq; hedges near Damanhur; deserted gardens and waste places of Kafr Emera near Medînet-el-Fayûm; in arabian gardens, not common.

Local name: qhamîs el Bint el Malek.

Also known from Southern Europe and the other parts of Northern Africa.

194. (2.) **Anemone** Tourn.

Rootstock perennial. Leaves radical. Flower-stem naked, excepting an involucre of three leaves usually at a considerable distance from the flowers. Sepals 5 or more, frequently 6, coloured and petal-like, longer than the stamens. No petals. Stamens numerous. Carpels numerous. 1-seeded, pointed or ending in a long feathery awn.

A large genus, found in almost all temperate regions of the globe, chiefly characterised by the 3 leaves placed in a whorl, from half-way up the flowering stem to very near the flowers. When much divided, these

leaves may appear more numerous, but they always form a single whorl, and are always united at the base into three.

471. **Anemone coronaria** L. Spec. Plânt. I (1753), p. 760. — Boiss. Fl. Or. I, p. 11. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 35 no. 1. — Sickenberg. Contrib. Fl. d'Eg., p. 181. — Aschers.-Schweinf. Primit. Flor. Marm., p. 592 no. 1. — Root-stock tuberous. Leaves servately parted or dissected. Calyx scarlet, or yellow, or rose-coloured; sepals broad. Carpels covered with dense wool, ending in a long, filiform style. — Flow. March to April.

M. ma. Marmarica; Matruqa; At Marut, in fields; Bringhi, not common; Ramle; Abukîr.

Local name: zeghlîl.

Also known from other parts of the Mediterranean region.

195. (3.) **Ranunculus** Linn.

Herbs with petioled entire lobed or dissected leaves and yellow or white flowers. Sepals 3—5 deciduous. Petals about 5, but varying in number from 4—20, with 1—3 glandular pits or scales near the base. Stamens many. Carpels numerous; styles short; ovules solitary ascending. Achenes numerous, 1-seeded.

A large genus of about 175 species, dispersed over the whole world, but most numerous in temperate or cool regions.

A. Aquatic or subaquatic plants 1. **R. trichophyllus**.

B. Terrestrial plants.

I. Carpels in a dense spike 2. **R. asiaticus**.

II. Carpels in cylindrical, ellipsoidal or globose heads.

a) Carpels not margined 3. **R. sceleratus**.

b) Carpels more or less flattened margined.

1. Carpels glabrous, never tubercled or muricate 4. **R. repens**.

2. Carpels tubercled or muricate.

α) Silky plants 5. **R. arvensis**.

β) Glabrous, rarely hairy plants.

§ Carpels with muricate disk 6. **R. muricatus**.

§§ Carpels with tubercled disk.

† Stems robust, petals

8 mm long 7. **R. trachycarpus**.

†† Stems weak, petals 3 to

4 mm long 8. **R. Guilelmi** Jordani.

472. **Ranunculus trichophyllus** Chaix in Vill. Dauph. I (1779), p. 355. — Boiss. Flor. Or. I, p. 23. — *Ranunculus paucistamineus* Koch Synops. II, p. 433. — Perennial; leaves immersed, multifid with capillary divisions. Flowers less than 1 cm broad. Peduncles usually shorter than the leaves, sometimes longer. Petals usually narrow, sometimes broad, less than twice as long as the sepals. Stamens few. Achenes numerous, sometimes sparingly pilose or foveolate. — Flow. March to April.

N. d. Sidi Ghazi (Behera); cultivated places near the "Polygone" at Cairo; in ditches.

Also known from Europe and Northern America.

var. **Aschersonii** (Freyn) Muschler comb. nov. — *Ranunculus Aschersonii* Freyn in Bot. Centralbl. (1881), Beilage 15 tab. 1 fig. 2. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 35 no. 4. — Sickenberg. Contrib. Fl. d'Eg., p. 171. — Stamens fewer than in the type. Achenes glabrous, rarely obscurely foveolate. — Flow. April.

N. d. Mansura; Abu Szabel; North of Tell-el-Jahudiye; in cultivated land on the east edge of the Delta; in the Nile near Kafr Dowar. — **N. f.** Floating in an affluent of the Bats, near the mouth of the Chasan near Tamia; in deep still waters of an affluent of the Bats, near Moqâtele. — **O.** Little Oasis: Aïn Helwa near Bawiti.

Only known from these localities. I have seen many specimens of this endemic variety, which leave no doubt in my mind that it is merely a local form of *Ranunculus trichophyllus* Chaix.

473. **Ranunculus asiaticus** L. Spec. Plant. I (1753), p. 552. — Boiss. Fl. Or. I, p. 31. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 35 no. 5. — Sickenberg. Contrib. Fl. d'Eg., p. 181 (var. *flavus*, *variegatus*, *sanguineus*!). — Aschers.-Schweinf. Primit. Flor. Marmar., p. 592 no. 3. — Perennial; roots tubereous; appressed hairy. Lower leaves round, crenate; the others more or less dissected, with oblong, toothed lobes. Flowers 1—5. Corolla 2—6 cm broad, crimson, scarlet or rose-coloured, or orange, or yellow, or white. Spike 2 cm, or more in length, dense. Carpels papyraceous. Beak reflexed, shorter than the ovary. — Flow. April.

M. ma. Marmarica; Matruqa; Mariut; abundantly in fields.

Also known from Western Marmarica, Cyrenaica, Tripolitania, Italy (Otranto), Asia, Cyprus, Syria, Palestine, Mesopotamia, Persia and Western Mediterranean region.

474. **Ranunculus sceleratus** L. Spec. Plant. I (1753), p. 776. — Boiss. Fl. Or. I, p. 52. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 35 no. 6. — An erect, much branched annual plant, glabrous or nearly

so. Stem thick and hollow. Lower leaves stalked, divided into three or more obtusely toothed or lobed segments, the upper one sessile, with three narrow segments. Flowers small and numerous, the petals pale yellow, scarcely longer than the calyx, and without any scale over the hollow spot at their base. Carpels very small and numerous, and in a dense head. — Flow. April to May.

N. d. N. f. N. v. River banks, on the sides of pools and wet ditches.

Local name: zaghlûl, zaghalanta.

Also known from Europe, Northern Africa, India and Northern America.

475. (4.) **Ranunculus repens** L. Spec. Plant. I (1753), p. 554. — Boiss. Fl. Or. I, p. 39. — Generally hairy, sometimes only slightly so, spreading by runners and forming large patches. Leaves petioled, 3-divided, the terminal division, or all three stalked, all ovate, cuneate or truncate, acute, cleft and lobed, often bloched. Petals obovate, much exceeding the spreading sepals; head of the fruit globose; achenes margined, tipped with a stout short slightly bent back. — Flow. June.

N. d. Damanhur; banks of the canal at Sidi Salem; not common.

Also known from Europe and Siberia.

476. (5.) **Ranunculus arvensis** L. Spec. Pl. ed. I (1753), p. 555. — Boiss. Fl. Or. I, p. 57. — Erect, silky pubescent, branched above. Lower leaves petioled, the upper sessile, all deeply cleft or divided into linear-oblong, obtuse, cuneate, lobed or toothed segments or the lowest entire; flowers middle sized, pale yellow, the petals exceeding the sepals; achenes 4--8, flattened, margined, spiny-tubercled on the sides, tipped with a subulate beak more than one half their length. — Flow. April.

M. ma. Alexandria-East; Wet ditches near Sidi Gaber.

Local name: Zaghalantah.

All the specimens of Egypt are silky pubescent and never glabrous or subglabrous like the European.

Also known from Middle and South Europe, Northern Africa and India.

477. (6.) **Ranunculus muricatus** L. Spec. Plant. I (1753), p. 780. — Boiss. Fl. Or. I, p. 56. — Aeschers.-Schweinf. Ill. Fl. d'Eg., p. 35 no. 9. — Glabrous or sparingly pubescent, branched from the base. Lower and basal leaves on long broad petioles, the blade reniform or cordate-orbicular, 3-lobed, cleft or crenate; the upper 3-divided, cuneate, short-petioled or sessile; flowers light yellow, the petals exceeding the calyx; head of fruit globular; achenes flat, densely muricate and spiny on the sides, tipped with a stout slightly curved beak of one half their length. — Flow. March to April.

- M. ma.** Mariut; Waste places near Alexandria West and East.
 — **N. d.** Banks of the Nile at the Barrage near Cairo.

Local name: zaghilil.

Also known from the other parts of the Mediterranean region, Arabia, Mesopotamia, Persia and India.

478. (7.) **Ranunculus trachycarpus** Fisch. and Mey. Ind. Semin. Hort. Petrop. III (1838), p. 46. — Boiss. Fl. Or. I, p. 55. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 35 no. 7. — Sickenbg. Contrib. Fl. d'Eg., p. 171. — Glabrous or sparingly pubescent, branched from the base. Root leaves round, 3-parted or cut. The remainder trifid, with lobed segments. Flowers light yellow, the petals exceeding the calyx; head of fruit spherical, about 5—10 mm in diameter. achenes flat, margin 2-grooved, disk tubercled, tipped with a beak of one-half of their length.

N. d. Banks of the canal near Alexandria; common in all irrigation-channels near Rosetta; Fumm el Khalig near Cairo.

Also known from Palestine, Cilicia and Kurdistan.

479. (8.) **Ranunculus Guilelmi Jordani** Ascherson in Sitzber. Naturf. Freunde, Berlin (1879), p. 40. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 35 no. 8. — Sickenberg. Contrib. Fl. d'Eg., p. 171. — An erect much branched annual plant with weak stems, glabrous or sometimes slightly hairy, 30—40 cm high. Lower leaves long-petioled, ovate-orbiculate, incised-crenate, those of the stem divided into oblong or linear somewhat cuneate lobes, petioled; upper cauline leaves sessile or short petioled, deeply 3-parted into linear or narrowly oblong entire segments; flowers yellow, petals as long as the reflexed sepals; achenes compressed; tipped with a slightly curved beak of one-half their length. — Flow. January to March.

N. d. f. O. Widely spread throughout.

Only known from Egypt and Palestine.

196. (4.) **Adonis** Dillen.

Annual, or perennial herbs. Leaves divided. Flowers red or yellow. Sepals 5. Petals 5 or more; sometimes more deeply coloured at the base, but without the nectary of *Ranunculus*. Stamens usually numerous. Carpels numerous, without awns, in a globular or oblong head each containing a single pendulous ovule.

The species are few, chiefly from southern Europe and western Asia.

- | | |
|-------------------------------------|---------------------------|
| A. Stem simple 1-flowered | 1. A. flammeus. |
| B. Stem branched | 2. A. microcarpus. |

480. (1.) **Adonis flammeus** Jacq. Flor. Austr. (1776), tab. 355. — Boiss. Fl. Or. I, p. 19. — Sickenberg. Contrib. Fl. d'Eg., p. 171. — Aschers. Flor. Rhinocol., p. 798 no. 2. — Stem stout. Leaves finely divided into numerous narrow linear segments. Sepals green or slightly coloured, appressed hairy. Petals linear-elliptical, flattened. Spike cylindrical, loose. Carpels ovate, ending in an ascending, black beak. Tooth obtuse near the base of the beak. — Flow. Spring.

M. ma. In fields near Mariut. — **M. p.** El-'Arish (Ascherson). All the specimens of Egypt are not branched.

Also known from Europe.

481. (2.) **Adonis microcarpus** DC. Syst. I (1818), p. 223. — Boiss. Fl. Or. I, p. 18. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 75 no. 2. — Sickenberg. Contrib. Fl. d'Eg., p. 171. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 592 no. 2. — Adonis Cupanianus Guss. Syst. II, p. 37. — Adonis aestivalis γ Cupanianus Huth Revis. Adonis, p. 64. — Adonis microcarpa β intermedia Boiss. Fl. Or. I, p. 18. — Annual, flower about 1 cm broad. Petals flattened, elliptical. Spike dense, oblong. Carpels small, pitted, oblong, ending in an ascending beak. Tooth short, obtuse, at the base of the beak. — Flow. February to March.

M. ma. Marmarica: Matruqa; Montaza; Alexandria-West and -East.

Local name: zaghlil (Muschler).

Also known from all the other parts of the Mediterranean region.

197. (5.) **Nigella** Tourn.

Annual herbs with leaves 1–3 pinnately dissected, into linear or capillary lobes. Flowers bluish. Petals small, clawed, with bilabiate lamina, the outer lip cleft into two or more lobes, and the inner smaller, entire or bifid. Nectar-pore at base of outer lip. Fruit composed of 5–12, more or less united follicles. Style long, beak-like.

A small genus of 16 species, widely distributed in the Mediterranean region, Middle Europe and Western Asia.

- A. Inner lip of the petal half as long as the outer one,
carpels 3–5 1. **N. arvensis**.
- B. Inner lip of the petal nearly as long the as outer one.
 - I. Carpels 3.
 - a) Lower leaves in rosettes 2. **N. deserti**.
 - b) Lower leaves not in rosettes 3. **N. Taubertii**.
 - II. Carpels 5–7 4. **N. sativa**.

482. (1.) **Nigella arvensis** L. Spec. Plant. I (1753), p. 753. — Boiss. Fl. Or. I, p. 56. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 35 no. 14. — Sickenberg. Contrib. Fl. d'Eg., p. 172. — Brand. Monogr. Nigella, p. 31. — Annual; leaves simple, or 1—2-pinnately divided. Claw short. Inner lip of the petal half as long as the outer one. Carpels 3—5, strongly 3-ribbed adherent for two thirds of their length, forming an obconical capsule; beak as long as the ovary, or a little shorter. — Flow. March to April.

M. ma. Alexandria, rare.

Also known from Algeria, Middle Europe and Asia.

var. **divaricata** Boiss. Fl. Or. I (1867), p. 66. — Ascherson Schweinf. Ill. Fl. d'Eg., p. 75 no. 11. — Sickenberg. Contrib. Fl. d'Eg., p. 172. — Brand. Monogr. Nigella, p. 33. — Nigella divaricata Beaupré ap. DC. Syst. I, p. 329. — Glaucous. Lobes of leaves short, obtuse. Upper leaves sometimes simple. — Flow. March to April.

M. ma. Alexandria; Mandara, not common.

Also known from the other parts of the Mediterranean region.

483. (2.) **Nigella deserti** Boiss. Flor. Or. I (1867), p. 67. — Ascherson Flor. Rhinocol., p. 789 no. 3. — Sickenberg. Contrib. Fl. d'Eg., p. 172. — Annual, 2—4 cm high. Flowers small. Petals short-clawed; inner lip nearly as long as the outer one. Carpels 3, adherent for one third of their length, 3-nerved below. 5-nerved above; beak a little longer than the ovary. — Flow. March to April.

M. p. From Bir Hussün eastward; between El-'Arish and Sebkhā Berdawil. — **D. a. sept.** Desert-el-Tih near Suez.

Also known from Syria, Arabia Petraea and Mesopotamia.

484. (3.) **Nigella Taubertii** Brand in Helios XIII (1895), p. 27 and 192. — Brand Monogr. Nigella, p. 34. — Nigella arvensis Coss. in Bull. Soc. Bot. France XXXVI, p. 100 not L. — Nigella arvensis var. divaricata Schweinf. and Aschers. in Primit. Flor. Marmar., p. 592 no. 4 not Boiss. — Stems decumbent, striate. Leaves ovate, the lowest rosellate. Flowers shortly involucrate or sometimes without bractlets. Sepals stipulate, cordate, ovate. Petals long-stipitate, outer lip bifid, lobes broad-ovate, appendiculate, the inner one ovate. Anthers aristate. Capsule small, 3-nerved, tuberculate. Styles shorter than the carpels. Grains compressed. — Flow. March to June.

M. ma. Marmarica: Matruqa.

Also known from Tripolitania and Cyrenaica.

485. (4.) **Nigella sativa** L. Spec. Plant. I (1753), p. 753. — Boiss. Fl. Or. I, p. 68. — Brand Monogr. Nigella, p. 36. — Aschers.-

Schweinf. Ill. Fl. d'Eg., p. 75 no. 12. — Sickenberg. Contrib. Fl. d'Eg., p. 172. — Annual. Flowers large. Petals short-clawed; inner lip nearly as long as the outer one. Carpels 5—7, inflated, warty at sides, united to the top; beak as long as the ovary. — Flow. March to June.

N. d. N. f. N. v. Drunka near Assiut, spontaneous; Everywhere cultivated.

Local name: niyeh; habb sûda, kamnûn iswid.

Also known from the other parts of the Mediterranean region to India.

198. (6.) **Delphinium** Tourn.

Annual or perennial herbs, with much divided leaves, the segments usually palmate and narrow. Sepals 5, coloured, terminating below in a hollow spur. Petals, in the Egyptian species 2, combined into 1, which is lengthened into a spur within that of the calyx; in some other species the petals are 4, the two upper ones forming a spur. Carpels 1—5, each with several seeds.

A considerable genus, widely spread over the northern hemisphere without the tropics. It is as well marked as *Aconitum*, by the peculiar irregularities of the calyx and corolla.

- A. Sepals blue. Petals 3-lobed 1. **D. Ajacis.**
- B. Sepals yellow. Petals 4-toothed, obovate, broader than long 2. **D. deserti.**
- C. Sepals blue. Petals 5-lobed.
 - I. Tomentellous 3. **D. nanun.**
 - II. Glabrous 4. **D. Bovei.**

486. (1.) **Delphinium Ajacis** L. Spec. Plant. I, p. 748. — Boiss. Fl. Or. I, p. 79. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 75 no. 13. — Sickenberg. Contrib. Fl. d'Eg., p. 172. — Radical leaves large, not unlike those of several Umbellifers, the stalk usually twice divided into 3 or 5 pinnately arranged branches, the segments or leaflets ovate, pointed, often 3-lobed and coarsely toothed, of a deep green, and quite glabrous. Stem 30—60 cm high, with few leaves, much smaller than the radical ones. Flowers small, nearly white, in a short, loose, oblong, terminal raceme. Follicles pubescent, 12—15 mm long. — Flow. March to April.

N. d. Cultivated and sometimes subsponaneous, abundantly.

Local name: lisân-el-asfür; niye; ayakabuh (Del.).

Also known from Central and Eastern Europe, Russian Asia and Northern America, extending to the Arctic circle.

487. (2.) **Delphinium deserti** Boiss. Fl. Or. I (1867), p. 83. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 35 no. 14. — Sickenberg. Contrib. Fl. d'Eg., p. 172. — Aschers. Flor. Rhinocol., p. 789 no. 4. — *Delphinium flavum* Decsne. in Plant. Palaest. Ann. Scienc. Nat. 1835 not DC. — Annual. Dwarf, puberulent, viscid, dichotomous from the base. Leaves oblong, minute. Flowers minute, terminal, yellow. Spur horizontal, as long as the petal. Follicle pubescent, oblong, few seeded. — Flow. March to April.

M. p. El-'Arish; Tawil-es-sakham. — **D. a. sept.** Wady-el-Hagg near Suez.

Also known from Palestine.

488. (3.) **Delphinium nanum** DC. Syst. I (1818), p. 349. — Boiss. Fl. Or. I, p. 87. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 35 no. 15. — Sickenberg. Contrib. Fl. d'Eg., p. 172. — *Delphinium peregrinum* Del. Ill. Fl. d'Eg., p. 17 not Linn. — *Delphinium grandiflorum* Forsk. Flor. aeg.-arab., p. 212 not Linn. — *Delphinium* Forskålei Reichenb. Ill. Acon., tab. 68. — Densely tomentellous; lower leaves short, cuneate, trifid, the others undivided linear; racemes loose few-flowered, petals ovate, lamina longer than the claw, spur horizontal or ascendent twice as long as the flower; carpels pubescent, ovate-oblong. — Flow. March to April.

M. ma. Montaza; Alexandria-West and -East; Abukîr.

Also known from Tripolitania and Cyrenaica.

489. (4.) **Delphinium Bovei** Decsne. Ann. Scienc. Nat. Ser. IV (1834), p. 356. — Boiss. Fl. Or. I, p. 87. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 35 no. 16. — Sickenberg. Contrib. Fl. d'Eg., p. 172. — Aschers. Flor. Rhinocol., p. 789 no. 5. — Annual. Dwarf, glabrous, excepting the appressed-pubescent peduncles. Branches rigid. Lower leaves oblong-spathulate, trifid. Stem leaves linear-lanceolate, acute, undivided. Racemes short, loose. Lamina of lateral petals one-half or one-third as long as claw. Spur ascending, thrice as long as the flower. Follicles glabrous somewhat divergent. — Flow. March to April.

M. p. Bir-el-Abd; Wady-el-Arish. — **D. a. sept.** Henwah near Suez.

Also known from Syria and Sinai.

36. Berberidaceae.

Flowers hermaphrodite. Sepals petaloid, usually 3—6—9, and petals 6 or 4 or more, fewer or 0, free, hypogynous, early deciduous, all or the inner imbricate in aestivation. Stamens usually 6 or 4,

free, hypogynous, opposite to the petals; anthers erect, 2-celled, usually dehiscent by valves. Pistil of a solitary, free carpel; ovary 1-celled; stigma usually with a peltate, discoid or dilated stigma, sessile or with a short style. Ovules few, basal or several on the ventral suture, anatropous. Fruit an indehiscent drupe in the only African species. — Shrubs or herbs. Leaves alternate fasciculate or radical, simple (unifoliolate) or compound. Flowers racemose, paniculate, cymose or solitary, usually yellow or white.

A small family, spread over the temperate regions or tropical mountains of the globe.

199. *Leontice* L.

Sepals 6, bracts 0. Petals 6, with a stipitate scale at the inner face of base. Stamens 6. Style short, stigma obtuse, indistinct. Ovules 2—4 basilar. Capsule inflated, seeds globular. — Glabrous herbs, with a thickly root, and leafy stem.

A small genus of only a few species in the Orient.

490. *Leontice leontopetalum* L. Spec. Plant. I (1753), p. 448. — Boiss. Fl. Or. I, 99. — Ascherson Schweinf. Ill. Fl. d'Eg., p. 36. — Aschers. Florul. Rhinocol., p. 789 no. 6. — Perennial. Leaves biternatisect, leaflets ovate or obovate, rarely subcordate. Inflorescence a large, dense, leafy panicle. Bracts oblong, much shorter than the pedicels. Capsule round-ovate, 2—3 cm long. — Flow. February to March.

M. p. Wady-el-'Arîsh.

Local name: kaqaf; khirsheyf.

Also known from Sinai and Syria, where the root is used as a remedy for Epilepsy.

37. *Menispermaceae*.

Flowers small, dioecious. Sepals usually 6, sometimes 9—12, rarely 4 or 1, nearly always free, usually imbricate, in 2—4 series; the outer smaller, often very minute. Petals 6, shorter than or not exceeding the inner sepals, rarely 4 or fewer, free or united (in *Cissampelos*) or 0. Male flower: Stamens equal in number and opposite to the petals, rarely fewer or more, free or united; anthers free, 2—4-celled, dehiscent longitudinally or transversely, or connate in a peltate disk. Female flower: Staminodia 6 or 0. Carpels free, usually 3, in few genera 1 or 6—12, sessile or stipitate; stigma terminal, entire or divided. Ovules solitary, usually amphitropous. Fruit-carpels drupaceous, with the scar of the style subterminal or by excentric growth, brought near to the base. Seed concave or

sulcate on the inner face, often curved in the form of a horseshoe around an intruded portion of the putamen, with uniform or ruminate albumen or exalbuminous; embryo with the cotyledons appressed or divaricate. — Climbing or twining shrubs or more rarely perennial herbs. Leaves alternate, exstipulate, usually palminerved, entire or lobed. Flowers small or minute, fascicled, cymose racemose or panicled, rarely solitary.

A considerable tropical Order, with a few species extending into cool countries both in the New and Old World. The species are generally easily recognizable by their climbing habit, minute unisexual 3-merous flowers, with stamens opposite to the petals, apocarpous pistil and the form of the seed.

200. *Cocculus* DC.

Sepals 6, in two series, 3 inner larger. Petals 6, shorter than the inner sepals, entire or bidentate, concave or with involute margins embracing the stamens. Male flower: Stamens 6, free, with 4-lobed anthers. Female flower: Staminodia 6 or 0. Carpels 3, with erect or recurved undivided styles. Drupes rotundate or obovate, compressed, with the scar of the style near the base. Putamen tuberculate or transversely rugose. Seed horseshoe-shaped, curved around opposite intruded processes of the putamen; embryo with linear, appressed cotyledons in a small quantity of fleshy albumen. — Climbers or rarely nearly erect. Leaves various in form but not peltate and rarely cordate. Flowers fascicled or solitary, cymose or paniculate, axillary.

A genus of 11 species; the Egyptian species has a wide distribution in the hotter parts of Asia, where a few other species of the genus are also indigenous.

491. *Cocculus pendulus* Diels in Engler Pflanzenreich IV fasc. 94 (1910), p. 237. — *Cocculus* *Leaeba* DC. Syst. I (1818), p. 529. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 36 no. 18. — *Cocculus ellipticus* DC. Syst. I, p. 526. — *Leaeba* Forsk. Flor. aeg.-arab., p. 172. — *Cebatha* Forsk. l. c., p. 171. — *Cebatha pendula* O. Ktze. Rev. gen. I, p. 9. — *Epibaterium pendulum* Forst Gen., p. 108, tab. 54. — *Menispermum edule* Vahl Symb. Bot. I, p. 80. — *Menispermum leaeba* Del. in Ill. Flor. d'Eg., tab. 51, fig. 2, 3. — *Bricchettia somalensis* Pax in Ann. Ist. Bot. Roma VI, p. 181. — A much-branched climber with slender glabrous or glabrate, striate, pale or ashen, leafy ramuli. Leaves small, rather coriaceous, lanceolate-oblong or -ovate or obtusely trapezoidal, entire or sometimes obscurely lobed, usually obtuse, rarely retuse, mucronate, cuneate or rather rounded at the base, glabrous or puberulous at first, more or less glaucous, 1—6 cm long, 1—1.5 cm broad. Petiole 1—6 mm long. Flowers small,

axillary, the males fascicled sessile or shortly pedicellate, the females ones solitary or in pairs on pedicels of 5—8 mm. — Flow. March to April.

D. a. sept. Moqattam; Wady Hof; Wady Dugla; Wady Riched; Wady Hamata; Wady Liblâbe; Gebel Magaier near Girge. —
D. a. mer. Qoseyr; Wady Gamûs; Gebel Silscle.

Local name: lebakh-el-gebel (Forskål).

Widely spread throughout the desert regions of Northern Africa, Arabia and Western India.

Rhoeadales.

Herbs or rarely shrubs or trees, often with pungent properties or coloured juices. Leaves various, usually normal, blades often dissected. Flowers perfect, sometimes irregular. Calyx and corolla present, the members distinct and separate. Androecium of several hypogynous stamens. Gynoecium of 2 or several united carpels. Ovary superior. Fruit capsular or baccate.

38. Papaveraceae.

Suborder I. Papaveroideae.

Flowers hermaphrodite, regular, fugacious. Sepals 2 or 3, free, caducous. Petals 4 or 6, hypogynous, free, imbricate and usually crumpled in aestivation. Stamens indefinite, free. Filaments filiform; anthers innate, 2-celled, dehiscing longitudinally. Pistil syncarpous; ovary superior, 1-celled with 2 to many parietal placentas, sometimes projecting nearly to the centre of the ovary; ovules indefinite, anatropous. Fruit a capsule, usually dehiscing by valves or pores, many-seeded. Seeds albuminous with a minute embryo. — Herbs or rarely shrubs with a milky or coloured juice. Leaves alternate or radical, simple or pinnatifid, exstipulate. Flowers usually solitary and terminal, red, violet, white or yellow.

Natives chiefly of the north temperate zone. Several species are common weeds of cultivation.

A. Flowers regular.

- | | |
|--|---------------------|
| I. Ovary an incompletely several-celled capsule;
stigmas 4—20 | 1. Papaver. |
| II. Ovary 1-celled. Stigmas 3—4; fruit elongated,
siliquiforme | 2. Roemeria. |
| III. Ovary a silique with spongy partition and 2-cells,
stigma 2-lobed | 3. Glaucium. |
| B. Flowers irregular, the similar petals opposite each
other in pairs; ovary 1-celled | 4. Hypecoum. |

201. (1.) **Papaver** Lim.

Capsule globular ovoid or slightly oblong, crowned by a circular disk, upon which the stigmas radiate from the centre, internally divided nearly to the centre into as many incomplete cells as there are stigmas, and opening by as many pores immediately under the disk. Flowers rather large, red, white, or purplish in the Egyptian species, or pale yellow in some other ones.

A large genus, extending over Europe, Asia, South Africa, and Australia, and introduced as weeds of cultivation into other parts of the world.

A. Stem leaves not clasping.

I. Capsule ovate.

a) Scallops of the disk overlapping 1. **P. rhoeas**.

b) Scallops of the disk not overlapping 2. **P. dubium**.

II. Capsule turbinate or cupuliforme 3. **P. humile**.

B. Stem leaves clasping.

I. Capsule glabrous.

a) Filaments subulate 4. **P. Decaisnei**.

b) Filaments clavate-dilatate at the top 5. **P. somniferum**.

II. Capsule setaceous.

a) Capsule ovate-globular 6. **P. hybridum**.

b) Capsule oblong-elliptical 7. **P. Argemone**.

492. (1.) **Papaver rhoeas** L. Spec. Plant. I (1753), p. 507. — Boiss. Fl. Or. I, p. 113. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 36 no. 20. — Aschers.-Schweinf. Primit. Flor. Marm., p. 592 no. 5. — An erect, branched annual, 20—60 cm high, with stiff spreading hairs or bristles. Lower leaves large, stalked, once or twice pinnately divided, the lobes lanceolate, pointed, and more or less cut. Flowers large, of a rich scarlet, with a dark eye, the filaments of the stamens not dilated. Capsule perfectly smooth, globular, or slightly top-shaped, with 8—12 stigmatic rays. — Flow. December to May.

M. ma. Marmarica; Ras-el-Kenaïs; Abusîr; Alexandria-East; Abukîr; Mariut. — **M. p.** Rosetta; Damietta; El-'Arish. — **N. d.** Abundantly on waste places.

Local name: zaghlîl; qarûn.

Also known from Europe and all the other parts of the Mediterranean region.

493. (2.) **Papaver dubium** L. Spec. Plant. I (1753), p. 1196. — Boiss. Fl. Or. I, p. 115. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 36 no. 21. — **Papaver obtusifolium** Desf. Fl. Atl. I, p. 407. — Very near **P. rhoeas**, but generally smaller and more slender, the leaves more cut, with narrower lobes, the hairs less spreading, and the

flowers rather smaller. It is more essentially distinguished by the capsule, which is oblong, often twice as long as broad, and narrowed at the base. — Flow. February to March.

M. ma. Ramle.

Also known from waste and cultivated ground of Europe and temperate and subtropical Asia.

494. (3.) **Papaver humile** Fedde in Bull. l'Herb. Boiss. 2, sér. V (1905), p. 446. — Fedde in Engler Pflanzenreich IV, fasc. 104 (1909), p. 306. — Annual herb, 6—7 cm high. Lower leaves rosulate, petiolate, pinnatifid or lobate with oblong entire lobes, 2—6 cm long. Stems erect or decumbent, short, with few leaves. Peduncles erect or ascendent, densely pilose. Petals broad obovate, 1 cm long. Flowers 3—4 cm in diameter. Capsule cupuliform or turbinate, glaucous, costate, 0.5—0.6 cm long. Disk plane broader than the capsule. — Flow. March.

M. ma. Mariut; Alexandria-West and -East. — **M. p.** El-'Arîsh.

Only known from these localities.

495. (4.) **Papaver Decaisnei** Hochst and Steud. in Schimp. Plant. arab. exsicc. (1835), no. 125. — Boiss. Fl. Or. I, p. 115. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 36 no. 22. — Webb Fragment. aeg., p. 11. — *Papaver turbinatum* Fres. in Mus. Senckenberg. I, p. 173 not DC. — *Papaver somniferum* δ Decaisnei O. Ktze Rev. Gen. I, p. 156. — An annual glaucous herb, glabrous, 10—25 cm high. Stem erect or ascendent, branched, glabrous, 3—10 cm long. Leaves glabrous, the lowest petioled, pinnatifid or pinnately lobed, 3—7 cm long, cauline leaves stem-clasping, sessile, mostly pinnatifid or pinnately lobed, smaller. Peduncles elongate, subscapiform, slender, glabrous. Sepals glabrous. Petals obovate, rose-coloured, 1—1.5 cm long. Filaments subulate, anthers shortly-oblong. Capsule glabrous ovate-oblong, subcostate, 1—1.5 cm long, 0.5—0.75 cm broad. Disk plane. — Flow. March to April.

M. ma. Alexandria-West.

Also known from Sinai, Afghanistan and Persia.

496. (5.) **Papaver somniferum** L. Spec. Plant. I (1753), p. 508. — Boiss. Fl. Or. I, p. 116. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 37. — Sickenberg. Contrib. Fl. d'Eg., p. 173. — *Papaver opiiferum* Forsk. Flor. aeg.-arab., p. CXIII no. 336. — *Papaver somniferum* β glabrum Boiss. Fl. Or. I, p. 116. — An erect annual, of a glaucous green, glabrous, or with a few hairs on the peduncle, scarcely branched, about 2 feet high or more. Leaves clasping the stem by their cordate base, oblong, irregularly toothed, and slightly sinuate or

lobed. Flowers large, usually of a bluish white, with a purple base. Filaments slightly dilated at the top. Capsule large, globular, and glabrous. — Flow. April to June.

N. d. N. v. Everywhere cultivated and often subspontaneous.

Local name: abun-nôm; shikh-shâkh (Ascherson).

Commonly cultivated for the sake of its milky juice (opium) in the warm and temperate portions of Europe, Asia and North Africa.

497. (6.) **Papaver hybridum** L. Spec. Plant. I (1753), p. 506. — Boiss. Fl. Or. I, p. 11. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 37 no. 23. — Sickenberg. Contrib. Fl. d'Eg., p. 173. — Aschers.-Schweinf. Primit. Fl. Marm., p. 592 no. 6. — Fedde Monogr. Papav. l. c., p. 332. — An annual herb. Setulose. Leaves bipinnati-partite, with linear segments. Petals vinous-red. Capsule ovate-globular, capiously, beset with strong, needle-like, curved bristles. Disk one-third as broad as the capsule. — Flow. March to April.

M. ma. Marmarica: Matruqa; Dakalla; Mariut; Alexandria-East. — **M. p.** El-Grady.

Local name: abun-nôm (Forskål.).

Widely throughout the Mediterranean region and Central Asia.

498. (7.) **Papaver Argemone** L. Spec. Plant. I (1753), p. 506. — Boiss. Fl. Or. I, p. 118. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 37 no. 24. — Annual, setulose. Leaves bipinnatisect, with acute lobes. Stem elongated, erect. Petals pale scarlet. Capsule oblong-elliptical, sparingly beset with weak, straight bristles. Disk a little narrower than the capsule. — Flow. March to April.

M. ma. Ramle; Mandara.

Also known from Middle Europe and the other parts of the Mediterranean region.

202. (2.) **Roemeria** Medik.

Sepals 2. Petals 4, crumpled in the bud. Stamens numerous. Style short; stigmas capitate. Capsule long, linear, opening from the summit downwards, in 3 or 4 valves, the placentas slender. Seeds without any crest-like appendage next the hilum. — Annual herbs with violet or crimson flowers.

A small genus of two or three species from the east Mediterranean region, perhaps all varieties of one.

A. Pods with few, short bristles, or glabrescent, little broader than the peduncle and longer 1. **R. hybrida**.

B. Pods with copious, spreading bristles, considerably broader than the peduncle and shorter 2. **R. dodecandra**.

499. (1.) **Roemeria hybrida** (L.) DC. Syst. II (1821), p. 92. — Boiss. Fl. Or. I, p. 118. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 37 no. 25. — Sickenberg. Contrib. Fl. d'Eg., p. 174. — Chelidonium hybridum L. Spec. Plant. I, p. 506. — An annual herb, 40—50 cm high. Leaves 2—3-pinnatisect, with linear lobes. Petals 2 cm long, 3 cm broad. Pods with few, short bristles, or glabrescent, little broader than the peduncle, and generally much longer. — Flow. March to April.

M. ma. Alexandria-East, not common. — **M. p.** Rosetta. —

D. i. Desert-el-Tih.

Also known from the other parts of the Mediterranean region.

500. (2.) **Roemeria dodecandra** (Forsk.) Stapf, Ergebn. Polak. Exped. Pers. in Denkschrft. Akad. Wiss. Wien LI (1886), p. 295. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 186. — Aschers. Flor. Rhinocol., p. 92 no. 9. — Sickenberg. Contrib. Fl. d'Eg., p. 174. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 592 no. 7. — Chelidonium dodecandrum Forsk. Flor. aeg.-arab., p. 100. — Roemeria orientalis Boiss. in Ann. scienc. nat., sér. 2 XVI (1841), p. 374. — Flor. Or. I, p. 118. — Supplem., p. 24. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 37 no. 26. — Roemeria hybrida var. dodecandra Durand et Barratte in Prodrum. Fl. Libye., p. 6. — Roemeria hybrida var. orientalis Coss. Comp. II, p. 67. — An annual herb, 7.5—25 cm high. Leaves pinnatisect or parted into ovate-oblong, lobed or dentate segments. Petals 1 cm long. Pods with copious, spreading bristles, considerably broader than the peduncle, and usually much shorter. — Flow. February to March.

M. ma. Mariut; Alexandria-West and -East. — **M. p.** El-'Arish.

— **D. a. sept.** Cairo; Gebel Iswid; Southern Galala.

Local name: riglet-el-ghorab. (Muschler).

Also known from Tripolitania, Arabia Petraea, Syria, Mesopotamia, Persia, Afghanistan.

203. (3.) **Glaucium** Tourn.

Sepals 2. Petals 4, crumpled in the bud. Stamens numerous. Ovary linear, contracted at the top into a 2-lobed stigma. Capsule linear opening in 2 valves, leaving 2 free linear placentas, forming a thin dry, spongy substance, in which the seeds are more or less imbedded.

A small genus of only a few species in Europe and the Mediterranean region.

501. **Glaucium corniculatum** Curt. Fl. Lond. VI (1817), p. 6 tab. 32. — Boiss. Fl. Or. I, p. 119. — Ascherson-Schweinf. Ill.

Fl. d'Eg., p. 37 no. 27. — Sickenberg. Contrib. Fl. d'Eg., p. 174. — Ascherson Flor. Rhinoc., p. 789 no. 10. — *Papaver corniculatum* Pall. Reise III, p. 591. — An annual herb, 30—50 cm high. All the leaves pinnatifid, with oblong, dentate segments, and truncate, lobed or dentate apex, the lower leaves petioled, the upper ones sessile, with truncated base. Sepals papillose, hairy. Pods appressed-hairy, hairs dilated at the base. — Flow. February to April.

M. ma. Abusir; Alexandria-West and -East; Mandara. — **M. p.** El-'Arish.

Local name: hashîshet-el-mamîta; semeysema.

Also known from the other parts of the Mediterranean region, Germany, Hungary, Southern Russia and Armenia.

204. (4.) **Hypecoum** Linn.

Sepals 2. Petals 4, convolute in bud, in opposite pairs, the outer entire or trilobed larger than the inner, which are tripartite. Stamens 4. Stigmas 2. Pod a loment, with 1 seeded cells, often separating into joints when the pod is ripe. — Annual herbs, with yellow, narcotic juice, and bipinnatisect, dissected leaves, intermediate between Papaveroideae and Fumarioideae.

A small genus of only a few species in Southern Europe and the Mediterranean region.

A. Exterior petals trilobed. Lobes of leaves oblong or oblong-linear.

I. Middle lobe of the petals barbate at the margin.

a) Pods erect, scarcely swollen at joints 1. *H. aegyptiacum*.

b) Pods moniliform, often with tumid joints 2. *H. deuteroparviflorum*.

II. Middle lobe of the petals, not barbate at the margin 3. *H. aequilobum*.

B. Exterior petals elliptico-rhomboid, entire.

Lobes of leaves linear-awl-shaped. . . 4. *H. pendulum*.

502. (1.) **Hypecoum aegyptiacum** (Forsk.) Aschers.-Schweinf. Ill. Fl. d'Eg. (1887), p. 37. — *Mnemosilla aegyptiaca* Forsk. Flor. aeg.-arab., p. 122. — *Hypecoum imberbe* Sibth. et Smith Flor. graec. II, p. 47 tab. 156. — Boiss. Fl. Or. I, p. 125. — *Hypecoum patens* Willd. flort. berol., tab. 5. — Sickenberg. Contrib. Fl. d'Eg., p. 174. — Glauous herb, scapes ascendent or prostrate. Leaves

glaucous, glabrous, erect, segments oblong, pinnati partite. Scapes dichotomously branched, 15—20 cm long. Sepals ovate or ovate-lanceolate, acuminate dentate-fimbriate. Petala flava, 2 exteriors unguiculate, 2 interiors trifid. Filaments linear-lanceolate, membranous-celate. Stigmata 2. — Flow. March to April.

M. ma. Abusîr; Mariut; Alexandria-West and -East. — **M. p.** Qatya; El-'Arish; Sheyk Zoyed.

Local name: Haluk et tomatim.

In all the other parts of the Mediterranean region.

503. (2.) **Hypecoum deuteroparviflorum** Fedde in Engler Pflanzenreich IV fasc. 104, p. 90. — *Hypecoum parviflorum* C. and W. Barbey Herbor. au Levant. p. 115 tab. 2. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 37 no. 29 not Kar. and Kir. — *Hypecoum dimidiatum* Aschers. and Schweinf. Ill. Fl. d'Eg. Supplem., p. 746 pr. part. — Sickenberg. Contrib. Fl. d'Eg., p. 174. — An annual herb, prostrate, glabrous, glaucous. Leaves all prostrate, bipinnatisect, 11 cm long, lobes pinnatisect, petiols 5 cm long, thickened at the base. Scapes prostrate or ascending, 7—15 cm long. Flowers minute. Sepals membranously margined. Petals yellow. Filament membranous alate. — Flow. March to April.

M. ma. Dekheyley near Mex. — **M. p.** Qatiya to El-'Arish.

Local name: qoreyn (Ascherson).

Also known from Syria.

504. (3.) **Hypecoum aequilobum** Viv. Flor. Libyc. (1824), p. 7 tab. 3 fig. 3. — *Hypecoum procumbens* var. *grandiflorum* Cosson Comp. Fl. Atl. II, p. 73 proparte. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 593 no. 8. — Sickenberg. Contrib. Fl. d'Eg., p. 174. — An annual herb. Stem ascending or prostrate. Sepals more or less acuminate, denticulate or entire. Lateral lobes of the inner petals oblong, entire, shorter than the middle one stipitate, subcordate, cochleariform, ciliate lobe. Pods erect-recurved, striate, nodose at joints. — Flow. February to March.

M. ma. Matruqa; Ramle; **M. p.** Rosetta.

Also known from Cyrenaica.

505. (4.) **Hypecoum pendulum** L. Spec. Plant. I (1753), p. 124. — Boiss. Fl. Or. I. p. 125. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 37 no. 30. — Sickenberg. Contrib. Fl. d'Eg., p. 174. — An annual herb, stem erect. Inner petals somewhat smaller than the outer ones, the middle lobe stipitate, nearly orbiculate, ciliate. Pods straight.

refracted, obsoletely 2—6 ribbed, separating late or not at all into joints. — Flow. March to April.

M. p. Qatiya. — **D. a. sept.** Wady Dugla.

Also known from all the other parts of the Mediterranean region and South Europe.

Suborder II. **Fumarieae.**

Flowers hermaphrodite, irregular in the African species. Sepals 2, minute, resembling coloured bracteoles. Petals 4, in two pairs, connivent, one of the two outer with a saccate or spurred base, two inner cohering at their apices. Stamens 6, diadelphous, the middle stamen of each bundle with a 2-celled anther, the lateral stamens with 1-celled anthers. Pistil syncarpous. Ovary superior, 1-celled, with 2 placentas; ovules 1-∞. Style filiform; stigma lobed or nearly entire. Fruit a several-seeded capsule or an achene. Seeds with a minute embryo and copious fleshy albumen. — Weak, decumbent or climbing herbs with watery juice. Leaves alternate or rarely opposite, multipartite. Flowers white rose or yellow, in terminal or leaf-opposed racemes in the African species.

205. **Fumaria** Linn.

Posterior petal spurred, united below with the two inner ones. Stamen united in two sets of three each. Style deciduous. Fruit globular, 1-seeded, indehiscent; seeds crestless. — Tender branching annuals, with finely disserted leaves, and small flowers in leaf-opposed or terminal racemes.

A genus of about in Middle Europe, Central Asia and Southern Africa.

A. Flowers 0,5 cm long.

I. Sepals broader than the corolla 1. **F. densiflora.**

II. Sepals narrower than the corolla, or wanting 2. **F. parviflora.**

B. Flowers 1 cm long.

I. Fruit smooth 3. **F. officinalis.**

II. Fruit tubercled 4. **F. judaica.**

506. (1.) **Fumaria densiflora** DC. Cat. Plant. Hort. Monsp (1813), p. 113. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 37 no. 32. — Sickenberg. Contrib. Fl. d'Eg., p. 174. — *Fumaria micrantha* Lag. Gen. et spec. nov. (1816), p. 21. — Boiss. Fl. Or. I, p. 136. — An annual herb, green, compact, erect or spreading. Lobes of the leaves narrowly linear. Sepals round-ovate, half as long as, and broader than the rose-coloured corolla. Bracts somewhat longer than the erect-spreading fruiting pedicels. Fruit globular, somewhat keeled, obtuse. — Flow. March to April.

M. ma. Mariut; Alexandria-West and -East. — **M. p.** El-'Arish. — **N. d.** Cairo; Birket-el-hagg; Tukh. — **N. f.** Medinet-el-Fayûm; Senûris. — **N. v.** Aswân. — **O.** Little Oasis; Farâfra; Dakhel; Great Oasis.

Local name: ziyeytah (Ascherson).

Also known from all the other parts of the Mediterranean region Southern Europe, Persia, and India.

507. (2.) **Fumaria parviflora** Lam. Encycl. II (1786), p. 567. — Boiss. Fl. Or. I, p. 135. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 37 no. 31. — Sickenberg. Contrib. Fl. d'Eg., p. 174. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 593 no. 9. — *Fumaria Vaillantii* Aschers. in Rohlfs Kufra, p. 409 et 508 (teste eo ipso) not Loisel. — An annual herb. Glaucous, diffuse. Lobes of leaves narrowly-linear, obtuse. Sepals ovate, dentate, acute, a little broader than the pedicel, one-sixth as long as white, rarely pinkish corolla. Bracts as long as erect-spreading fruiting pedicels. Fruit globular, apiculate. — Flow. March to June.

M. ma. M. p. N. d. N. f. N. v. Abundantly in waste places, on the margins of the fields, often in deep sandy places.

Local name: shahtarag; shatreyq.

Also known from all the other parts of the Mediterranean region, Europe, Abyssinia, Western Asia and India.

508. (3.) **Fumaria officinalis** L. Spec. Plant. I (1753), p. 984. — Boiss. Fl. Or. I, p. 134. — A delicate pale green annual, perfectly glabrous, usually forming, when it commences flowering, a dense tuft of a few inches in height, but the stem often grows out from 30—90 cm; it is then generally weak or trailing, and sometimes slightly climbing, supported by the twisted petioles. Leaves much divided into numerous segments, generally 3-lobed, the lobes varying in shape from narrow-linear to broadly lanceolate or oblong. Flowers in racemes of 2—6 cm, either terminal or opposite the leaves, dense at first, but often lengthening much as the flowering advances. Pedicels short, in the axil of a very small, scale-like, white or coloured bract. Sepals small, white, or coloured like the bracts, and often toothed. Petals oblong-linear, forming a tubular corolla, with dark-coloured tips, the spur at the base giving it the appearance of being attached laterally to the pedicel. Nut usually about 3 mm in diameter, somewhat compressed laterally. — Flow. April.

N. d. Damanhur; Zaqaziq.

Also known from all the other parts of the Mediterranean region, Middle and Northern Europe, Asia and Abyssinia.

509. (4.) **Fumaria judaica** Boiss. Diagn. Plant. Or. Ser. I fasc. 3 (1849), p. 15. — Fl. Or. I, p. 138. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 37 no. 33. — Sickenberg. Contrib. Fl. d'Eg., p. 174. — *Fumaria alexandrina* Ehrenberg Hausskn. Monogr., p. 43 tab. V. — An annual erect or ascending herb. Lobes of the leaves oblong, acutish. Sepals oblong-lanceolate, much narrower, and one-fourth as long as the pale-pink, purple-tipped corolla. Bracts from half as long to as long as the fruiting pedicells. Fruits smaller than the last, compressed, keeled, obtuse. — Flow. February to April.

M. ma. Mariut; Abundantly near Alexandria-West and -East.
 --- **M. p.** Rosetta. — **N. d.** Tukh.

Local name: shahtarag.

Also known from Syria and Palestine.

39. Capparidaceae.

Flowers regular or the sepals or petals sometimes unequal, rarely polygamous. Sepals 4, rarely 3 or 5, free or connate below, valvate imbricate or open in aestivation. Petals 4 or 0, rarely 3 or indefinite, sessile or clawed. Torus sometimes with a linear, oblong or ligulate-tubular appendix. Stamens definite or indefinite, inserted upon the torus, which is sometimes shortly columnar, or the filaments adherent more or less to the gynophore; filaments equal or unequal, usually filiform; anthers usually oblong or linear, 2-celled, dehiscing longitudinally (some of them effete in certain species). Ovary sessile or supported upon a gynophore of various length, usually ovoid, globose or oblong, 1-celled or divided by spurious dissepiments into 2 or more cells. Ovules indefinite, sometimes few, parietal. Fruit a siliquiform capsule, or baccate, oblong, globose or elongate, cylindrical or torulose, many- or few-, rarely 1-seeded. Seeds usually more or less reniform, or somewhat angular in baccate fruits, with a crustaceous or coriaceous testa; albumen thin or 0. Embryo usually curved; cotyledons plane, folded or convolute; radicle often conical and incumbent. — Herbs, shrubs or trees, often scandent, glabrous, pubescent, tomentose, glandular or scabrid. Leaves alternate, rarely fasciculate, simple or 3—7-foliolate, leaflets usually entire; stipules, when present, minute or represented by short spines. Flowers axillary or terminal, solitary, racemose, corymbose, fascicled or umbellate, often showy.

A large family of tropical and subtropical countries of both hemispheres.

A. Fruit a siliquiform capsule with 2 valves separating from a persistent replum.

I. Stamens inserted upon the torus 1. **Cleome.**

II. Stamens inserted upon the gynophore 2. **Gynandropsis.**

- B. Fruit a winged achene 3. *Dipterygium*.
 C. Fruit various, usually indehiscent, baccate.
 I. Sepals connate below in a tube; lobes free . 4. *Maerua*.
 II. Sepals free, open imbricate or valvate, in one
 or two series 5. *Capparis*.

206. (1.) *Cleome* Linn.

Sepals 4, ovate, lanceolate, linear or subulate, free or coherent below, deciduous or persistent. Petals 4, equal or unequal, clawed or sessile, entire or nearly so, imbricate, convolute or open in aestivation. Stamens 4—20, all or two or more anther-bearing, often unequal and more or less declinate, inserted upon the torus, free or very shortly coherent at the base. Ovary sessile or stipitate, 1-celled; ovules indefinite on two parietal placentas; style various or 0. Capsule linear, oval or ellipsoidal, sessile or stipitate, 1-celled, with membranous or rather coriaceous valves separating from a persistent replum. Seeds indefinite, reniform or globose-reniform, glabrous or pilose, smooth or variously rugose; cotyledons incurved or circinnate. — Herbs or shrubs, rarely subarborescent, glabrous glandular, scabrous or aculeolate. Leaves simple or 3—7-foliolate, leaflets entire or serrulate. Flowers racemose or solitary and axillary, white, yellow or purplish.

A large genus of tropical and subtropical countries both of the Old and New World.

A. Leaves simple.

I. Stamens 4—6.

- a) Branches 30—60 cm long. Glandular
 setulose or scabrous. Leaves lanceolate
 to ovate-lanceolate. Stamens 6. Capsule
 linear-oval 2—6 cm; pendulous. Seeds
 pilose 1. *C. trinervia*.
 b) Low, branching, hispid. Leaves broadly
 ovate-rotundate. Stamens 4. Capsule
 usually under 1.5 cm long. Seeds minutely
 glandular 2. *C. droserifolia*.

II. Stamens 10—14 3. *C. chrysantha*.

B. Leaves 3—5—7-foliolate.

- I. Capsule linear, pendulous; seeds cottony
 pilose 4. *C. arabica*.
 II. Capsule oval or elliptical; seeds nearly smooth 5. *C. brachycarpa*.

510. (1.) *Cleome trinervia* Fresen. in Mus. Senckenberg I (1834).
 p. 177 tab. XI. — Boiss. Fl. Or. I, p. 414. — Aschers.-Schweinf. Ill.

Fl. d'Eg., p. 43 no. 104. — *Cleome Aschersoniana* Pfund Flora LVII (1874) p. 41. — Branches, 30—60 cm long, glandular-setulose. Leaves lanceolate, ovate-lanceolate or oval, rather acute, more or less densely glandular, 3-nerved below, 3 cm long, or less in our specimens, on petioles of 1 cm or shorter. Racemes at length elongate. Bracts oval or linear, shorter than the pedicels or obsolete. Sepals lanceolate to ovate, 3—4 times shorter than the oval clawed petals. Stamens 6. Fruit linear-oval, sessile or subsessile, $2\frac{1}{2}$ to $4\frac{1}{2}$ cm long, about 6 mm broad, pendulous, on patent pedicells; valves scabrid. Style very short or stigma subsessile. Seeds pilose. — Flow. March to April.

D. i. Ismailia. — **D. a. sept.** Suez; Wady Khafûra; Southern Galala.

Also known from Arabia and Tropical Africa.

511. (2.) ***Cleome droserifolia*** Del. Ill. Flor. d'Eg. (1813). p. 317 tab. 36 fig. 2. — Boiss. Fl. Or. I, p. 415. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 43 no. 105. — Sickenberg. Contrib. Fl. d'Eg., p. 181. — *Cleome Roridula* R. Br. in Salt. Abyss. App., p. 65. — A low much-branched and shrubby glandular-hispid plant of 6—20 cm. Leaves broadly ovate-rotundate, obtuse, with a more or less truncate triplinerved base, setose, hispid or scabrous, 0.5—1.5 cm diam., equalling or usually shorter than their petioles. Flowers axillary, pedicellate. Sepals glandular-setose. Petals somewhat lanceolate with a thickened scale-like appendage at the base. Stamens 4. Ovary oblong or oval, shortly and densely glandular, sessile or subsessile, with a very long slender style. Fruit oval, 8—12 mm long, with setose-hispid concave valves. Seeds reniform-globose, rather compressed, minutely granular. — Flow. March to April.

O. Siwa. — **D. l.** Es-Sabrigâb; Kafr Hakim; Abu Roash; Pyramids of Gîza; Siut; Esne, rare. — **D. a. sept.** Suez; Wady Khafûra; Galala; Ekhnîm. — **D. a. mer.** Kene, on calcareous ground; El-Kâb, rare; Qoseyr; Wady Gadîre; Râs-Benâs; Gebel Ferâye.

Local name: rih-el-bard; 'afeyn (Klunzinger); machta (Schweinf.).

Also known from Nubia, Abyssinia and Arabia.

512. (3.) ***Cleome chrysantha*** Decaisne in Ann. Sc. Nat. Sér. 2 Vol. III (1834), p. 274. — Boiss. Fl. Or. I, p. 416. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 43 no. 106. — An ascending or diffuse herb 16—38 cm high or sometimes flowering as seedlings of 2—5 cm. Stem leafy, simple or branched, pilose or hirsute with spreading simple or glandular hairs. Leaves from rotundate- to oblong-ovate, obtuse or scarcely acute, entire, shortly glandular-hirsute, 6—14 mm long, on more or less spreading petioles shorter than or exceeding

the blade. Flowers in the axils of the upper leaves, which usually equal or exceed the pedicels. Stamens 10—14, of which a few are often smaller or effete. Style slender, equalling or exceeding the oblong-oval, closely glandular-pilose, sessile or subsessile ovary; stigma capitate. Capsule oval-oblong, 4—8 mm long. Seeds globose-reuniform, minutely pitted-rugulose. — Flow. March to April.

D. l. Abu Roash; Wady Esne. — **D. a. sept.** Suez; Wady Etit; Gebel Ferâye. — **D. a. mer.** Qoseyr.

Local name: sfeyr-atân; sâfira (Schweinf.).

Also known from Tropical Afrika.

513. (4.) **Cleome arabica** L. Amoen. IV (1756), p. 281. — Boiss. Fl. Or. I, p. 411. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 43 no. 102. — Cleome Siliquaria R. Br. in Salt. App., p. 65. — Aschers. Flor. Rhinocol., p. 791 no. 34. — Erect, simple or branched, scabrous. Leaves 3-phyllous or the upper simple; leaflets usually oblanceolate or linear, rather obtuse, glabrous or scabrous. Racemes leafy. Stamens 6 (or 5). Ovary sessile or subsessile. Capsule linear-oval, scabrous, often pendulous. Seeds cottony-pilose. — Flow. March to June.

D. l. **D. i.** **D. a. sept.** **D. a. mer.** Abundantly on calcareous ground.

Local name: mintine; shegeret-wâhash; meagnûne.

Widely spread in Northern and Tropical Africa. Has an disagreeable smell.

514. (5.) **Cleome brachycarpa** Vahl in DC. Prodrum. I, p. 240. — Boiss. Fl. Or. I, p. 412. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 43 no. 103. — Cleome ornithopodioides Forsk. Ill. Flor. aeg.-arab., no. 402 not L. — Cleome Vahlia Fresen. Mus. Senckenb. l. c. — Cleome parviflora R. Br. in Salt, Abyss., p. 65. — A low diffuse herb 8—16 cm high, more or less glandular-pubescent or scabrid-setulose, sometimes glabrescent. Leaves 3—5—1-foliate, petiolate or the upper sessile; leaflets oblanceolate or oblong, acute or obtuse and mucronulate. Flowers pedicellate in the axils of the upper leaves or distinctly racemose with simple or 3-foliate bracts. Pedicels slender, much exceeding or equalling the bracts. Sepals lanceolate. Stamens 6, of which one is sometimes imperfect. Ovary minutely glandular or glabrous, sessile. Style slender. Capsule oval or elliptical, usually glandular, 4—8 mm long, longer or shorter than the style; stigma capitate or subcapitate. Seeds nearly smooth. — Flow. March to April.

D. a. mer. Qoseyr; Wady Lekhuma; Island of Shirget.

Local name: berberân.

Also known from Abyssinia, Kordofan, Nubia, Arabia and N.W. India.

207. (2.) **Gynandropsis** DC.

Sepals 4, deciduous. Petals 4, unguiculate. Stamens about 6, inserted upon the elongated gynophore. Ovary stipitate, 1-celled, with 2 multiovulate parietal placentas. Fruit and seeds as in *Cleome*. — Leafy herbs, with digitate, 3—7-foliolate leaves. Racemes bracteolate. Flowers usually white or purple.

A small genus, common to the tropics of both hemispheres, artificially distinguished from *Cleome* by the insertion of the stamens upon the gynophore.

515. **Gynandropsis pentaphylla** DC. Prodr. I (1824), p. 238. Aschers.-Schweinf. Ill. Flor. d'Eg., p. 43 no. 101. — *Cleome pentaphylla* L. Spec. Plant. I, p. 938. — *Gynandropsis denticulata* DC. Prodr. I, p. 238. — *Cleome acuta* Schum. Thonning. Guin. Plant., p. 293. — An erect herb of 20—60 cm high or sometimes shrubby below and taller, or reduced to 6 or 8 cm; the extremities and young leaves usually thinly pilose or pubescent. Leaves 5-foliolate: the upper 3-foliolate; leaflets obovate or oblanceolate, acute acuminate or obtuse, denticulate serrulate or entire. Racemes with simple or 3-foliolate bracts. Flowers white or purplish. Fruit narrow-linear, tapering into the style, usually puberulous or minutely setulose, 4—8 cm long; gynophore 1—4 cm, with the scar of the stamens near the middle. Style variable in length or stigma subsessile. — Flow. February to March.

M. ma. Bir Burdan; Abusir; Alexandria-West and -East; Mandara; Abukir. — **N. d.** Alexandria; Rosetta; Damanhur, as a weed; Tanta; Zifta; Zaqaziq; Qalyub; Cairo. — **N. v.** Siut; Kene; Luksor; Esne; Edfu; Kom Ombo; Aswân.

Local name: arareg (Delile); tamalika; abu-garn (Ascherson).

Common in waste places, in fields, and about villages. It is used as a pot-herb. A North African and Indian species, occurring also in the New World, but doubtfully indigenous there.

208. (3.) **Dipterygium** Decsne.

Sepals short. Silicles ellipsoidal, slightly compressed laterally, indehiscent, girt with a membranous wing, 1-celled, 1-seeded. Seed not margined; cotyledons concave; radicle incumbent. — A shrubby plant with numerous straight, rigid, divaricate branches, terminating in narrow small and rather distant-flowered, bracteolate racemes. Leaves very small, oblong or ovate, entire, on very short petioles.

A small genus of only one species occurring in Northern and Tropical Africa, Arabia and N. W. India.

516. *Dipterygium glaucum* Decaisne in Ann. scienc. Natur. Ser. 2 Vol. 10 (1834), p. 67. — Boiss. Fl. Or. I, p. 417. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 43 no. 107. — Glabrous or granular-scabrid. Leaves 4—15 mm long, glabrous or rough with glands. Sepals short. Silicles ellipsoidal; seeds not margined. — Flow. April.

D. a. mer. Gebel Ferrâye near Old Berenice.

Also known from Tropical Africa, Arabia and N. W. India.

209. (4.) **Maerua** Forsk.

Sepals 4, connate below in a tubular or infundibuliform tube, valvate in aestivation; lobes deciduous; tube more or less persistent. Petals 0 or 4, inserted in the mouth of the calyx-tube. Disk usually distinct, lining the calyx-tube, with or without a free toothed fimbriate or nearly entire margin. Stamens indefinite, inserted upon a columnar torus which usually equals or slightly exceeds the calyx-tube; filaments free. Ovary cylindrical linear oblong or ovoid, on a long gynophore, 1-celled or 2-celled owing to the meeting of the placentary plates; ovules indefinite, strictly parietal or inserted upon the spurious dissepiment; stigma sessile or subsessile. Fruit baccate, ovoid globose or narrow and torulose, the constrictions of the pericarp sometimes separating it into numerous 1-seeded segments. Seeds (which have been examined in very few species) are described as reniform or subreniform; cotyledons incumbent, convolute, sometimes fleshy. — Shrubs or small trees destitute of spines, glabrous or pubescent. Leaves simple or 3-foliolate, often with minute setaceous stipules. Flowers axillary solitary or fascicled, or in terminal racemes or corymbs.

A considerable genus extending from Senegal eastward through Arabia to India; occurring also at the Cape, in Madagascar, and the Islands of the Indian Ocean.

517. *Maerua crassifolia* Forsk. Flor. aeg.-arab. (1775), p. 104. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 43 no. 108. — Boiss. Fl. Or. I, p. 419. — Sickenberg. Contrib. Fl. d'Eg., p. 181. — Branches smooth. Leaves about 1 cm long or less, succulent, cuneate-ovate or oval, somewhat retuse. Peduncles 1-flowered, solitary, slender, 1 cm long. Calyx 4-fid, glabrous; tube urceolate, 4-gonous; segments oblong, obtuse, ciliate, reflexed. Corolla 0. Corona multifid. Stamens about 30. Ovary cylindrical, glabrous. Fruit 1 cm diam. — Flow. March to April.

O. Dakhel; Great Oasis.

Local name: morgam (Ascherson).

Also known from. Nubia and Arabia.

210. (5.) **Capparis** Linn.

Sepals 4 (very rarely 5), free or connate at the base (or united and splitting irregularly in some species not Egyptian), equal or the two outer broader and more concave or the two inner petaloid. imbricate or valvate, or in two series, the outer pair valvate in aestivation. Petals 4. Stamens indefinite ($8-\infty$), inserted upon the torus. Filaments free. Ovary upon a gynophore usually from 1—5 cm in length, 1-celled or sometimes few-celled, with 2 or more parietal placentas; ovules usually indefinite; stigma sessile. Fruit stipitate with one or many seeds, indehiscent or sometimes separating into 3 or 4 valves. — Trees or shrubs, often climbing or sometimes prostrate, unarmed or with short, often recurved, stipular spines. Leaves simple, coriaceous or submembranous, rarely wanting. Flowers usually hermaphrodite, solitary, racemose, corymbose or umbellate, axillary or terminal.

A large genus widely spread through the tropics and warmer regions both of the New and Old World. The nine or ten principal subdivisions of the genus are principally based upon differences in the sepals.

- A. Leafless plants; flowers in fascicles or corymbs . . 1. **C. decidua**.
- B. Plants with leaves.
 - I. Leaves rotundate 2. **C. spinosa**.
 - II. Leaves ovate 3. **C. galeata**.

518. (1.) **Capparis decidua** (Forsk.) Edgew. in Journ. Linn. Soc. VI (1862), p. 184. — *Sodada decidua* Forsk. Flor. aeg.-arab., p. 81. — Delile Ill. Flor. d'Eg., tab. 26. — *Capparis Sodada* R. Brown in Denham and Clapp. Append., p. 20. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 43 no. 109. — Sickenberg. Contrib. Fl. d'Eg., p. 181. — *Capparis aphylla* Roth Nov. Plant., p. 238. — A much-branched, glabrous tree or shrub. Branches terete, leafless, excepting in young plants and on barren shoots, usually with short, nearly straight or ascending, stipular spines. Leaves, when present, linear or linear-lanceolate. Flowers about 2.5 cm diam., in lateral and terminal fascicles or corymbose racemes. Pedicels 1 cm or shorter. Sepals unequal in breadth; the anterior outer sepal larger and deeply saccate, but slightly imbricate or subvalvate (at least the 2 outer) in aestivation. Ovary on a gynophore of 1—2 cm. Style about half as long as the ovary. Fruit ovoid, pointed or subglobose, several- or many-seeded. — Flow. Dezember to March.

O. Little Oasis; Dakhel; Great Oasis. — D. 1. Abu Roash; Pyramids of Giza. — D. a. sept. Suez, abundantly, mouths of the

Wadies; Atfih. — **D. a. mer.** Kene, abundantly on stony ground; Esne; Silsile; Aswân; Qoseyr; Gebel Ferâye.

Local name: haqbaq (Lippi.); generally; tundub.

Also known from Tropical Africa.

519. (2.) **Capparis spinosa** L. Spec. Plant. I (1753). p. 720.

Boiss. Fl. Or. I, p. 420. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 43 no. 110. — Sickenberg. Contrib. Flor. d'Eg., p. 181. — DC. Prodr. I, p. 245. — Capparis aegyptiaca Lam. Dict. I, p. 605. — DC. Ill. Fl. d'Eg., tab. 31 fig. 3. — Capparis spinosa var. aegyptiaca Boiss. Fl. Or. I, p. 420. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 594 no. 76. — A glabrous or more or less tomentose, trailing shrub; the extremities usually puberulous or tomentose, armed with recurved or nearly straight, stipular spines. Leaves coriaceous, rotundate or from broadly obovate to broadly ovate, retuse or entire, mucronate, pale green or glaucescent. 1—3 cm diam.; petiole 2—6 mm. Flowers large, 2—6 cm across, axillary, solitary or forming loose, unilateral, leafy racemes. Peduncles equalling or exceeding the subtending leaf. Sepals subequal in length, the two outer deeply concave or the anterior more deeply saccate. Petals white, exceeding the sepals. Fruit oval-oblong or clavate, on a strong gynophore of 2½ cm. separating at length into 3 or 4 valves. — Flow. March to April.

O. Siwa; Farâfra; Dakhel; Great Oasis. — **D. l.** Abu Roash; Pyramids of Giza; Between Siut; Qaraq; pyramids of Zâwiyet-el-'Aryân. — **D. i.** Gebel Nehy Geham near El-'Arish; Ismailia; Ramses; Es-Sâlihiya. — **D. a. sept.** Wady Dugla; Wady Turra; Wady Hof; Helwan; Wady Rished, abundantly; Wady khafûra; Galala.

Local name: kabar (Delile); lassaf (Schweinfurth); shôk-el-homâr (Ascherson); ward-el-gebel (Muschler).

Spreading through the Mediterranean region and Egypt, this species extends east-ward to Western India. The buds are pickled as "capers".

var. **rupestris** (Sibth.) Boiss. Fl. Or. I (1867), p. 421. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 43 no. 110. — Sickenberg. Contrib. Flor. d'Eg., p. 181. — Aschers.-Schweinf. Prim. Flor. Marm. p. 594 no. 26. — Capparis rupestris Sibth. and Smith Prodr. I, p. 355. — Glabrous, leaves large, suborbiculate obtuse, often subcordate at the base; stipules setaceous, deciduous. — Flow. April.

M. ma. El-Mahari; Matrûqa; Bir-el-Kadwa; Alexandria East.

Local name: shafella (Roth).

Also known from all the other parts of the Mediterranean region and from Southern Europe.

520. (3.) **Capparis galeata** Fres. Beitr. Fl. Abyss. in Mus. Senckenberg II (1837—1845), p. 111. — Boiss. Fl. Or. I, p. 421. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 43 no. 111. — Sickenberg. Contrib. Flor. d'Eg., p. 181. — A glaucous, leafy, diffuse shrub; extremities pulverulent. Leaves thick and cartilaginous, ovate to rotundate, tipped with a more or less curved or hooked mucro. 2—6 cm long, 1—4 cm broad. Stipules spinose. Flowers solitary, axillary; peduncles stout, recurved in fruit. Sepals 4, the larger galeate. Petals roundish. Fruit baccate, clavate-pyriform, 6—9 cm long, on a stipes of about $2\frac{1}{2}$ —4 cm. Seeds reniform. — Flow. March to April.

D. a. sept. Serapeum, rare; Suez, very rare; Galala. — **D. a. mer.** Kene, not rare, on calcareous ground; Qoseyr; Wady Gadire.

Local name: lasaf; rasaf.

Also known from Tropical Africa, Arabia and Western India.

40. Cruciferae.

Flowers hermaphrodite, regular or the petals on the side turned from the axis larger. Sepals 4, free, the lateral pair often more or less saccate at the base or inserted a little lower than the others. Petals 4, rarely 0, narrowed below or clawed, spreading and cruciate above. Stamens usually 6, four inner ones in pairs and longer than the two outer. Ovary 1-celled with 2 parietal placentas, or more usually 2-celled owing to the development of a thin membranous septum connecting the placentas. Style simple or 0; stigma 2-fid or undivided; ovules 1, 2, or indefinite, usually horizontal or pendulous. Fruit long (siliqua) or short (silicule), 2-celled or sometimes 1-celled, dehiscing by valves which separate from their persistent, seed-bearing margins (replum), or indehiscient, or separating into cocci or 1-seeded articles. Seeds rarely albuminous. Embryo usually with plane or plano-convex cotyledons, the radicle either folded against their edges (accumbent o) or against the back of one of them (incumbent o =), or the cotyledons conduplicate or doubly or spirally folded. — Herbs, sometimes shrubby with colourless often pungent juice, glabrous, glaucous, or with simple medio-fixed or stellate hairs. Leaves simple, alternate, exstipulate, pinnatifid toothed or entire. Flowers racemose or corymbose at first, rarely bracteate, usually white, yellow or rose.

The Crucifers form a large and extremely natural family, comprising about 220 genera and between 2000—2800 species. The species are distributed over the whole world, but are most plentiful in the temperate regions of the Northern Hemisphere, and especially to in Southern Europe and Asia

Minor. They are rare in the tropics, particularly where there are no mountain ranges. Most of them possess antiscorbutic and stimulating properties, and many are staple articles of foods. Not a few of the cultivated species (and others) have become naturalised in Egypt.

A. Suborder *Siliquosae*. — Pods siliques, linear or oblong (except in *Anastatica*, *Savignya* and *Carrichtera*), dehiscent for their whole length, or all except the top. Valves parallel to the septum, and equalling it in breadth.

I. *Arabideae*. — Seeds orbicular or oval, in one row (except in *Nasturtium* and *Nasturtiopsis*. Cotyledons accumbent (in *Nasturtiopsis* incumbent).

a) Not desert plants.

- | | |
|---|-------------------------|
| 1. Woolly herbs. Flowers pinkish-purple, yellow or livid. Pods flattened, often 2-horned | 1. <i>Matthiola</i> . |
| 2. Canescent, shrubby plants. Flowers large, yellow. Pods 4-angled . . . | 2. <i>Cheiranthus</i> . |
| 3. Glabrous or glabrescent herbs. Flowers white or yellow. Pods linear or oblong, turgid. Seeds in 2 rows . . . | 3. <i>Nasturtium</i> . |
| 4. Herbs, usually pubescent; radical leaves spatulate. Flowers white, pink or yellow. Pods linear, flattened, 1-nerved. Seeds sometimes in 2 rows | 4. <i>Arabis</i> . |

b) Desert plants.

- | | |
|---|---------------------------|
| 1. Green herbs. Flowers yellow. Pods short, cylindrical, turgid | 5. <i>Nasturtiopsis</i> . |
| 2. Prostrate, stellate-tomentose herbs. Flowers whitish-pink. Pods oblong, terete | 6. <i>Morettia</i> . |
| 3. Dwarf, appressed-canescant herbs. Flowers minute, white. Pods oblong, keeled, 2-horned | 7. <i>Notoceras</i> . |
| 4. Dwarf stellate-canescant herbs. Flowers minute, white. Pods ovate-spherical, auricled | 8. <i>Anastatica</i> . |

II. *Sisymbrieae*. — Pods linear. Seeds thickish, mostly oblong, usually in 1 row. Cotyledons incumbent, or obliquely accumbent.

- | | |
|---|-----------------------|
| a) Stigma bilamellate; flowers white, pink or yellow; delicate herbs. | 9. <i>Malcolmia</i> . |
|---|-----------------------|

- b) Stigma sessile, or with 2, short lobes.
 - 1. Neither canescent, nor clothed with branching, appressed hairs.
 - α) Leaves pinnatifid or parted. Flowers yellow, pink, or white . . . 10. *Sisymbrium*.
 - β) Leaves oblong or elliptical, clasping. Flowers yellow. 11. *Conringia*.
 - 2. Canescent with appressed, branching hairs 12. *Erysimum*.
- III. *Brassicaceae*. — Pods linear, or oblong (except *Savignya* and *Carrichtera*). Cotyledons conduplicate.
 - a) Pods linear, or oblong, not beaked.
 - 1. Seeds in one row, wingless. Flowers yellow.
 - α) Valves 1-nerved 13. *Brassica*.
 - β) Valves 3-nerved 14. *Sinapsis*.
 - 2. Seeds more or less in two rows, wingless. Flowers yellow, white, pinkish-purple, or lilac-pink.
 - α) Calyx equal; stigma truncate or bilobed 15. *Diplotaxis*.
 - β) Calyx bisaccate; stigma conical, erect 16. *Moricandia*.
 - b) Pods oblong, elliptical, or nearly spherical, beaked.
 - 1. Plants canescent.
 - α) Pods oblong or linear; beak ensiform 17. *Eruca*.
 - β) Pods elliptical, chartaceous; beak aristate 18. *Savignya*.
 - γ) Pods nearly spherical; beak chartaceous 19. *Carrichtera*.
 - 2. Plants glabrous 20. *Schouwia*.
- B. Suborder *Siliculosae*. — Pods silicles (occasionally oblong, or linear), dehiscent for their whole length, or nearly to their apex.
 - I. Valves flattened parallel to the septum, or not flattened.
 - a) *Alyssinae*. — Pods ovate, elliptical, lenticular, orbiculate, or oblong. Seeds in 1—2-rows, or sometimes 1 in each cell. Cotyledons accumbent.

1. Pods 1—5 cm long, elliptical, oblong, or linear, sometimes sinuate.
 - α) Pods elliptical or linear; seeds numerous, winged. Flowers purplish 21. *Farsetia*.
 - β) Pods orbicular or elliptical, 2 cm long, seeds numerous, winged. Flowers yellow 22. *Fibigia*.
2. Pods less than 1 cm long, lenticular, elliptical, globular or orbicular.
 - α) Pods orbicular, flattened. Flowers white 23. *Lobularia*.
 - β) Pods obovate, orbicular, elliptical, or lenticular, flattened. Flowers yellow, or yellowish-white . . . 24. *Alyssum*.
- b) *Camelineae*. — Pods oblong-linear, ovate, obovate, elliptical or orbicular. Seeds in 2 rows, rarely in 1. Cotyledons incumbent.
 1. Pods linear. Dwarf, 5—10 cm high. Glabrous plants. 25. *Leptaleum*.
 2. Pods ovate, obovate. Tall, 30—50 cm high. 26. *Camelina*.
- II. Valves flattened contrary to the septum.
 - a) *Lepidiineae*. — Pods ovate, obovate, obcordate, orbicular or elliptical; valves boat-shaped. Cotyledons incumbent, conduplicate or convolute.
 1. Pods obcordate or ovate, wingless; seeds numerous 27. *Capsella*.
 2. Pods ovate, elliptical, or orbicular, wingless rarely winged. Stamens 4 or 2. Flowers minute, white or yellow 28. *Lepidium*.
 - b) *Thlaspidiae*. — Pods compound of twin, orbicular cells or oblong, elliptical, ovate, obovate, obcordate, or obtriangular. Cotyledons accumbent. Flowers yellow 29. *Biscutella*.
- C. Suborder. — *Nucamentaceae*. Pods indehiscent, twin or single nutlets, wingless or winged.
 - a) *Coronopodeae*. — Pods twin, 1-celled nutlets. Cotyledons narrow, incumbent, 2-plicate 30. *Coronopus*.
 - b) *Isatideae*. — Pods single nutlets, winged or wingless, 1-celled with 1—2 seeds, or 2—4-celled with 1 seed in each cell.

1. Pods winged, bony or horny, with leathery or papery wings 31. *Isatis*.
 2. Pods wingless.
 - α) Cotyledons incumbent, flat, or transversely wrinkled; pods small, 2 cm long, flattened; style awl-shaped . . . 32. *Neslea*.
 - β) Cotyledons wrinkled lengthwise.
 - † Pods ovate-spherical, rough; style apiculate 33. *Calepina*.
 - †† Pods obliquely ovate, with oblique beak. Desert herbs 34. *Schimpera*.
 - γ) Cotyledons conduplicate; pods ovate-pyramidal, 2-celled; horny, desert shrubs 35. *Zilla*.
- D. Suborder *Lomentaceae*. — Loments transversely 2-jointed; lower joint indehiscent, seedless; or dehiscent, 2-celled, 2—∞-seeded; or more or less obsolete; upper indehiscent, 1-celled, 1—∞-seeded, or 2—∞-celled, cells in 1—2-rows, 1-several seeded.
- I. *Cakilinae*. — Lower joint of the loment conspicuous, indehiscent, seedless; or dehiscent, seedless or seeded. Upper joint 1-celled, 1—6-seeded, or with 1—∞-cells, in one row.
- a) Lower joint of the pod indehiscent.
 1. Loment not elongated.
 - α) Lower joint obovate; seedless; the upper one ovate, ribbed 36. *Rapistrum*.
 - β) Lower joint oblong; seedless; the upper one ovate-pyramidal, ribbed . . . 37. *Didesmus*.
 - γ) Lower joint 2-toothed at the top; the upper one ensiform, 1-seeded . . . 38. *Cakile*.
 2. Loment elongated; lower joint 1—3-seeded, the upper one ∞-seeded.
 - α) Lower joint many-seeded 39. *Enarthrocarpus*.
 - β) Lower joint 1-seeded 40. *Reboudia*.
 - b) Lower joint of the pod dehiscent, 2-celled, each cell 2—6-seeded 41. *Erucaria*.
- II. *Raphaneae*. — Loments with obsolescent or obsolete lower joint; upper joint 1-celled, ∞-seeded; or with numerous, 1-seeded cells, in 1—2 rows, cells at length separating . . . 42. *Raphanus*.

211. (1.) *Matthiola* R. Br.

Sepals erect; two lateral inserted slightly lower upon the torus, and convex or saccate at the base. Petals spreading, usually with a long claw. Stigma sessile with connivent lobes, sometimes thickened or horned at the base. Siliqua long and narrow, terete or compressed, with a thick pitted septum. Seeds numerous, in one row, flattened and usually narrowly winged; radicle accumbent. — Perennials or annuals, covered with a hoary tomentum or pubescence. Leaves entire, sinuate or toothed. Flowers tolerably large, usually purple, in terminal racemes.

A genus of about 30 species, mostly confined to the shores of the Mediterranean and the West of Europa. One species occurs at the Cape.

A. Perennials; stem erect, much branched. 1. *M. incana*.

B. Annuals; stigma 2-horned. Pods terete.

I. Lamina of the petals obovate or oblong, purple
or pink 2. *M. humilis*.

II. Lamina of the petals oblong to linear-lanceolate,
livid, wavy margined.

a) Horns of the prominent stigma 4—6 times
as long as the diameter of the pod 3. *M. oxyceras*.

b) Horns of the prominent stigma 2—3 times
as long as the diameter of the pod 4. *M. livida*.

521. (1.) *Matthiola incana* B. Br. in Ait. Hort. Kew. (1812), p. 119. — Boiss. Fl. Or. I, p. 148. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 37 no. 35. — Sickenberg. Contrib. Flor. d'Eg., p. 175. — *Cheiranthus incanus* L. Spec. Plant. I, p. 924. — Erect, usually perennial, and more or less woody at the base, but not of long duration; 30—60 cm high, with hard, slightly spreading branches. Leaves oblong-linear, obtuse, quite entire, soft and hoary on both sides, with short crisped hairs. Flowers purple or reddish, rather large, the petals obovate. Pod 8—10 cm long, crowned by the short stigmas, which are rather thickened at the base. — Flow. March.

N. d. Mansura; Often cultivated in gardens and sometimes spontaneous.

Local name: manthûr madbaq; manthûr; kheyly.

Also known from the other parts of the Mediterranean region and Western Europe.

522. (2.) *Matthiola humilis* DC. System. II (1821), p. 177. — Boiss. Fl. Or. I, p. 155. — *Matthiola pumilio* subsp. *hirta* Conti in Mém. Herb. Boiss. fasc. XVIII, p. 69. — *Matthiola acaulis* DC. Prodrum. I, p. 133. — Muschler in Fedde Rep. III, p. 214. —

Aschers.-Schweinf. Ill. Flor. d'Eg., p. 38 no. 36. — Supplem. Ill. Flor. d'Eg., p. 746. — Sickenberg. Contrib. Flor. d'Eg., p. 175. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 593 no. 10. — Annual, ashy-velvety, 10 cm high. Leaves linear or lanceolate, dentate, or pinnatifid. Flowers sessile; pods 3—5 cm long, 1.5 cm broad; stigma short, conical or bigibbous, horns 1 to 2 mm long, horizontal. — Flow. March to April.

M. ma. Marmarica: Matruqa; Mariut; Alexandria-East and -West; Mariut; Montaza. — **M. p.** Rosetta.

Local name: shegâra.

var. **caulescens** Muschler comb. nov. — *Matthiola acaulis* var. *caulescens* Muschler in Fedde Repert. spec. nov. III (1906). p. 214. — Stems erect. — Flow. April.

M. p. Port Said, rare.

var. **hirta** Boiss. Fl. Or. I (1867), p. 155. — *Matthiola acaulis* var. *hirta* Muschler in Fedde Repert. spec. nov. III. p. 214. — With a very long indument. — Flow. April to March.

M. ma. Alexandria; Behig-Mariut; Abukîr. — **D. a. sept.** Matariya near Cairo.

var. **ecornuta** Boiss. Flor. Or. I (1867), p. 155. — *Matthiola acaulis* var. *ecornuta* Muschler in Fedde Rep. spec. nov. III, p. 214. — Horns obsolete or 0. — Flow. March to April.

M. ma. Alexandria; Mergheb-Mariut.

All the varieties only known from Egypt.

523. (3.) **Matthiola oxyceras** DC. System. II (1821), p. 173. — Boiss. Fl. Or. I, p. 155. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 593 no. 11. — Sickenberg. Contrib. Flor. d'Eg., p. 175. — Annual. Canescent, glandular. Leaves oblong-lanceolate, sinuate, or pinnatifid. Pod 7 cm long, 1 mm broad, terete, torulose; horns of prominent stigma acute, awl-shaped, 4—6 times as long as diameter of pod, horizontal or deflexed. — Flow. March to April.

M. ma. Matruqa; Alexandria.

Local name: manthûr.

Also known from Sinai and Syria.

524. (4.) **Matthiola livida** DC. Syst. II (1821), p. 164. — Boiss. Fl. Or. I, p. 156. — Deless. Icon. II, tab. 12. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 38 no. 37. — Sickenberg. Contrib. Flor. d'Eg., p. 175. — *Cheiranthus lividus* Del. Ill. Fl. d'Eg., no. 591. — *Cheiranthus tristis* Forsk. Flor. aeg.-arab., p. 119 not L. — Annual, canescens;

stems branched from the base. Leaves entire or subentire, repand or sinuate-pinnatifid. Flowers sessile. Pods terete, torulous tomentous often contorted; stigma between the subulate horizontal horns as long as or twice as long as the diameter of the pod. — Flow. April.

M. p. Between Qatiya and El-'Arish; Rosetta, in deep sandy places, rare on calcareous ground; Damietta; Port Said, rare. — **D. l.** Pyramids of Giza; Between Alexandria and Siwa in deep sandy places; Abu-Roash not rare on calcareous ground. — **D. i.** Mahsama; el-Qantara; Es-Sâlihîya, in sandy places and sand dunes; Ismailia; Ramses-Station, not rare; El-'Arish. — **D. a. sept.** Cairo: Abbasiya; Galala; Wady Khafûra; Nefishe near Ismailia; Serapeum; Suez.

Local name: nakeysy; shuqara; nō'emanyia (Forskål).

Also known from Tunisia, Tuareg-Land, Algeria, Morocco and Palestine.

212. (2.) *Cheiranthus* Linn.

Habit and character of *Matthiola*, except that the hairs are bipartite and appressed, the flowers are orange or yellow, or under cultivation, red, purple, or brown, the pod more distinctly flattened, the very short stigmas spreading horizontally, not erect, and usually borne on a distinct style, and the seeds not winged.

The genus is reduced by some to a single species, by others made to include a very few species from southern Europe and the Canary Islands.

525. ***Cheiranthus Cheiri*** L. Spec. Plant. I (1753), p. 924. — DC. Syst. II, p. 179. — DC. Prodr. I, p. 138. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 38. — Boiss. Fl. Or. I, p. 185. — *Cheiranthus Corinthius* Boiss. Diagn. Plant. Or., ser. 2, I, p. 18. — Flor. Or. I, p. 186. — *Cheiranthus Lenoneri* Heldr. and Sartor. Catal. Hort. Athen. 1862. — Boiss. Fl. Or. I, p. 186. — A perennial of longer duration and more woody than the common stock, more branched and less hoary, the hairs forked at the base, and closely pressed on the surface, or often quite green and nearly glabrous. Leaves narrow, pointed, quite entire. Flowers rather large, generally of a rich orange-yellow, and sweet-scented, but varying from pale yellow to a deep red. Pods 4—6 cm long, the valves with a slightly prominent midrib. — Flow. January to March.

M. p. Damietta, Old Arabian gardens, and sometimes naturalized. — **N. d.** Cultivated in Arabian and European gardens.

Local name: manthûr.

Also known from Europe and the other parts of the Mediterranean region.

213. (3.) **Nasturtium.**

Sepals short, loose or rather spreading, equal or nearly so. Petals narrowed to the base, sometimes wanting. Stamens 6 or fewer. Stigma entire or 2-lobed, subsessile or with a short style. Siliqua usually linear or narrow-oblong, nearly terete, with a membranous septum; valves nerveless or with a very slender nerve. Seeds usually 2-seriate, with short free funicles. Radicle accumbent. — Erect or diffuse, usually branching terrestrial or aquatic herbs, with pinnatifid or sometimes entire leaves and white or yellow (or lilac), ebracteate or bracteate flowers.

A genus of between 20 and 30 species, some of them are very widely dispersed, but most abundant in the temperate and warm regions of the Northern Hemisphere.

A. Flowers white. Placental glands 4, valvular 0.

I. Petals twice as long as the sepals 1. **N. fontanum.**

II. Petals as long as the sepals 2. **N. niloticum.**

B. Flowers yellow. Placental glands 4, valvular 2 . . . 3. **N. palustre.**

526. (1.) **Nasturtium fontanum** Aschers. in Flor. Prov. Brdbg. (1864), p. 32. — *Nasturtium officinale* R. Br. in Ait. Hort. Kew. (1812), p. 110. — DC. Syst. II, p. 188. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 38 no. 42. — Sickenberg. Contrib. Flor. d'Eg., p. 175. — Boiss. Fl. Or. I, p. 178. — *Sisymbrium Nasturtium* L. Spec. Plant. I, p. 916. — *Sisymbrium aquaticum* Shaw. Specim., no. 559. — *Cardamine fontana* Lam. — Stem much branched, sometimes very short and creeping, or floating in shallow water; sometimes scrambling on wet banks or bushes to the length of 60 cm or more. Leaves pinnate, with distant segments, the terminal one usually longer, ovate or orbicular. Flowers small and white, in short racemes. Pod about 10 or 16 mm long or rather more, on spreading pedicels, but slightly curved upwards, the double rows of the seeds very distinct. — Flow. February to March.

N. d. Alexandria; Nefishe and Ismailia; Along the fresh-water canal. — **N. f.** Everywhere on alluvial ground.

Local name: qorrat-el-ain.

Also known from the other parts of the Mediterranean region, Europe, Tropical Africa and Asia.

527. (2.) **Nasturtium niloticum** Boiss. Diagn. Plant. Or. Ser. I fasc. VIII (1849), p. 19. — Boiss. Fl. Or. I, p. 178. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 38 no. 43. — Sickenberg. Contrib. Flor. d'Eg., p. 175. — Glabrous, stems erect, branched from the base. Leaves lyrate-pinnatifid, segments oblong, lobate. Flowers minute;

petals white-rose-coloured, oblong-linear, as long as the sepals; pods linear, turgid, attenuate; grains scabrous. — Flow. January to April.

N. v. Kimâm; Esne.

Also known from Nubia

528. (3.) **Nasturtium palustre** DC. System. II (1821), p. 191. — Viv. Flor. Libye., p. 36. — Boiss. Flor. Or. I, p. 179. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 38 no. 44. — Sickenberg. Contrib. Flor. d'Eg., p. 175. — *Sisymbrium palustre* Leyss. Flor. Hal., p. 166. — *Nasturtium terrestre* R. Br. in Ait. Hort. Kewens. IV, p. 110. — *Nasturtium semipinnatifidum* Hook. Journ. Bot. I, p. 246. — A slender leafy branched herb with weak or decumbent stems 12—50 cm long, glabrous or slightly hairy. Leaves variable, usually lyrate-pinnatifid, auricled at the base with the lobes toothed or irregularly lobed, sometimes almost entire toothed or sinuate-lobed. Flowers small, yellow, in lax racemes. Pedicells slender, ebracteate. Petals about equalling the sepals. Pods oblong, turgid, slightly curved when ripe 0.63—3 cm long. Seeds numerous, crowded, in 2-row. — Flow. February to April.

M. ma. Mariut; Abusir; Alexandria-West and -East, on alluvial ground; Mandara; Abukir. — **N. d.** Damanhûr; Mansura; Damietta; Mehâlet-el-Kebîr; Tanta; Zaqaziq; Talka; Tell-el-Kebîr; Qalyub; Cairo, abundantly. — **N. v.** Frequent on alluvial ground.

Local name: manthûr; mufrad (Ascherson).

An abundant plant in the temperate portions of both hemispheres.

214. (4.) **Arabis** Linn.

Sepals rather short, equal or the lateral sepals saccate at the base. Petals entire, usually clawed. Siliqua sessile, narrow-linear, elongate, compressed; the valves plane, keeled or with a midnerve; septum membranous; stigma simple or 2-lobed. Seeds usually in one series, compressed, with or without a narrow wing. Radicle accumbent. — Glabrous or pubescent herbs. Radical leaves usually more or less spatulate; cauline sessile. Flowers racemose, white or coloured, ebracteate.

A large genus, chiefly of the north temperate zone.

529. **Arabis albida** Stev. in Cat. Hort. Gor. (1812), p. 51. — Mém. Soc. Nat. Mosc. III, p. 270. — DC. Syst. II, p. 217. — Boiss. Fl. Or. I, p. 174. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 38 no. 41. — *Arabis caucasica* Willd. Enum. Supplem., p. 45. — *Turritis verna* Desf. Flor. Atl. II, p. 92. — *Arabis thyridoidea* Sibth. and Smith Flor. graec. tab. 642. — *Arabis viscosa* DC. Syst. II, p. 216. — *Arabis*

Billardieri DC. Syst. II, p. 218. — *Arabis brevifolia* DC. Syst. II, p. 218. — *Arabis longifolia* DC. Syst. II, p. 219. — Perennial, canescent or woolly. Stems 20 cm high, simple, or often slightly branched. Root-leaves ovate-oblong, obtuse; stem-leaves ovate, clasping, sparingly toothed. Petals white, showy, 1.5 cm long. Pods 4 cm long, 14 mm broad, torulose, erect or somewhat spreading. — Flow. March to June.

N. v. Thebais (Figari).

Widely spread in the Canary Islands, Southern Europe, Syria, Asia minor and Persia.

215. (5.) *Nasturtiopsis* Boiss.

Calyx equal at the base. Petals clawed, entire. Placental glands 2, elongated; valvular, 2, semiannular. Stigma simple. Pods oblong, turgid; seeds in 1 or 2 rows; cotyledons incumbent. — Annuals with yellow flowers, resembling *Nasturtium*.

A small genus of only one species in the East of the Mediterranean region and N.W. Africa.

530. ***Nasturtiopsis coronopifolia*** (Boiss.) Muschler comb. nov. — *Sisymbrium coronopifolium* Desf. Flor. Atl. II (1798), p. 82 tab. 154. — Viv. Flor. Libyc., p. 36. — *Sisymbrium ceratophyllum* Desf. Flor. Atl. II, p. 82. — *Nasturtium coronopifolium* DC. Syst. II, p. 194. — *Nasturtium ceratophyllum* DC. Syst. II, p. 193. — Aschers. and Schweinf. in Aschers.-Schweinf. Ill. Flor. d'Eg., p. 38 no. 45. — Sickenberg. Contrib. Flor. d'Eg., p. 175. — *Nasturtiopsis arabica* Boiss. Flor. Or. I, p. 237. — Aschers. Flor. Rhinocol., p. 790 no. 19. — Annual, sparingly pubescent, green. Leaves oblong, dentate, or pectinate-pinnatifid. Pods 1.2 cm long, 1.5 mm broad, incurved, as long as the slender pedicels. — Flow. March to April.

M. ma. Mariut, abundantly. — **D. i.** Wady-el-'Arish.

Also known from Tunisia, Algeria and Palestine.

216. (6.) *Morettia* DC.

Sepals erect, equal. Petals narrow or linear. Siliqua nearly terete, erect, recurved above, on a short thick pedicel; valves rigid, nerved or subcarinate, somewhat septate within, tardy in dehiscing; style short; stigma 2-lobed. Seeds compressed in a single row. Radicle accumbent. — Branched, leafy, rather rigid herbs, with entire or dentate, stellate-hispid or hoary, sessile or subsessile leaves. Racemes leafy.

A small desert genus of North Africa and Arabia.

531. **Morettia philaeana** DC. Syst. II (1821), p. 426. — Boiss. Fl. Or. I, p. 145. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 37 no. 34. — Sickenberg. Contrib. Flor. d'Eg., p. 175. — Sinapis philaeana Del. Ill. Flor. d'Eg., p. 99 tab. 33. — **Morettia asperrima** Boiss. Ann. Scienc. Nat. 1842, p. 60. — Diagn. Plant. Orient. Ser. I fasc. VIII p. 17. — Perennial, asperulous. Stems thickly, ascendent. Leaves short-petioled, oblong, or ovate-oblong, entire or obsoletely repande, 1 to 1,5 cm long. Petals as long as the sepals. Pods erect-patulous, 1 cm long; stigmas divergent. — Flow. March to April.

O. Great Oasis. — **D. l.** Abu Roash; Pyramids of Zâwiyet-el-'Aryân; Pyramids of Giza. — **D. a. sept.** Esne; Abundantly in the Wadies, on calcareous ground. — **D. a. mer.** Qoseyr.

Local name: saggar (Schweinfurth); thagar; taghagha (Klunzinger).

Also known from Sinai and Palestine.

217. (7.) **Notoceras** R. Br.

Calyx somewhat spreading, equal at the base. Petals minute, white. Pods short, somewhat dehiscent; valves keeled, honeycombed on their inner face, ending in a divergent mucro, longer than the style; stigma capitate. — Dwarf, desert annuals, canescent with bipartite hairs.

A small genus of only one species occurring in the Canaries, Spain, Northern Africa and Arabia.

532. **Notoceras bicornе** (R. Br.) Caruel Flor. Toscan. (1860), p. 536. — **Notoceras canariense** R. Br. in Ait. Hort. Kew. ed. 2, IV (1821), p. 117. — DC. Syst. II, p. 203. — Boiss. Flor. Or. I, p. 314. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 39 no. 59. — Sickenberg. Contrib. Flor. d'Eg., p. 175. — **Erysimum bicornе** Ait. Hort. Kew. ed. 1, II, p. 394. — **Diceratium prostratum** Lagasca Gen. et spec., p. 20. — **Notoceras hispanicum** DC. Syst. II, p. 204. — An annual plant, 5—10 cm high, ascending. Leaves oblong-linear, tapering at the base, 2 cm long. Pods 1 cm long, 1,5 mm broad; mucro 1 m long. — Flow. March to April.

D. a. sept. Gebel ahmar near Cairo. — **D. i.** Isthmus of Suez (Figari).

Also known from the Canaries, Southern Europe (Spain), Palestine and Arabia Petraea.

218. (8.) **Anastatica** Linn.

Calyx erect, equal at the base. Petals minute, white. Pod ovate-globose, inflated, 2-celled, dehiscent when wet. Valves with a trans-

verse auricle at the apex, divided within by a transverse partition into two compartments; seeds solitary in each compartment, pendulous. Style awlshaped; stigma indistinct. — Dwarf, dichotomous, prostrate annuals. Fruiting plant indurated, woody, with branches incurved, forming a globe, which expands again when immersed in water. Fruit persistent.

A small genus of only one species in Northern Africa, Syria and Arabia.

533. **Anastatica hierochnutica** L. Spec. Plant. I (1753), p. 895. — Forsk. Flor. aeg.-arab., p. 117. — Delile Ill. Fl. d'Eg., p. 574. — Boiss. Fl. Or. I, p. 316. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 39 no. 60. — DC. Syst. II, p. 425. — An annual plant. Stellate-canescens. Leaves obovate, repand, tapering into a short petiole. Fruits very short, bearing a round concave auricle on each side of the broad apex, from the centre of which projects the persistent subulate style. — Flow. February to May.

D. l. D. i. D. a. sept. D. a. mer. Abundantly on sandy ground and between stones.

Local name: keff-mariam; keff fathma-bint-en-nebi; qbêda; kammâsh-en-nebî.

Also known from the other parts of Northern Africa, Syria and Arabia. It is the "Rose of Jericho" brought from the Holy Land by the pilgrims as a symbol of the resurrection, also found in a Christian tomb at Antinoë.

219. (9.) **Malcolmia** R. Br.

Calyx erect, equal, or bisaccate at the base. Petals clawed. Pods elongated, terete, often tardily dehiscent, tapering into a capitate or conical stigma, formed by two connivent lamellae. — Annual herbs, with pink, white, or yellow flowers.

A small genus widely distributed in the Mediterranean region.

A. Pods erect.

I. Plants canescens 1. **M. aegyptiaca**.

II. Plant glabrous 2. **M. pygmaea**.

B. Pods torulose 3. **M. torulosa**.

534. (1.) **Malcolmia aegyptiaca** Spreng. System. II (1825), p. 898. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 39 no. 52. — Eremobium lineare Boiss. Fl. Or. I, p. 157. — Hesperis ramosissima Del. Ill. Fl. d'Eg., p. 595 not Desf. — Hesperis diffusa Decsne. Fl. Sin. in Ann. Sc. Nat. ser. 2, III, p. 271. — Annual, 10—35 cm high, prostrate or ascending, branching from the base, compact. Leaves sessile, oblong to oblong-linear, entire. Racemes dense, many-flowered; flowers 5 mm long, overtopped by young pods; pedicels

half as long as the calyx, or less. Fruiting raceme compact; pods 1.5 cm long, 1 cm broad, stellate-canescens, 6—18-seeded. — Flow. February to May.

M. p. Rosetta.

Local name: dakhayân.

Also known from Tunisia, Algeria, Morocco and Syria.

var. **linearis** Coss. Illustr. Flor. Atlant. I (1883), p. 22 tab. 15 fig. 1—15. — *Matthiola linearis* Del. Fragm. Arab. Petr., p. 16 no. 56, fig. 3, straggling. Leaves sessile, oblong-linear, or cylindrical, fleshy. Racemes loose, few flowered; flowers 8—10 mm long, not overtopped by young pods; pedicels nearly as long as the calyx; fruiting raceme elongated, loose; pods 15—25 mm long, 2 mm broad, puberulent or glabrescent, 4—8-seeded, seeds twice as broad as in the type. — Flow. March.

M. p. D. l. D. i. D. a. sept. D. a. mer. Abundantly in sandy places and often on calcareous ground.

Local name: dakhayân; qoreyn (Wady-el-'Arîsh, Ascherson).

Also known from the other parts of Northern Africa and from Palestine and Sinai.

var. **diffusa** (Decsne.) Aschers. and Schweinf. in Aschers.-Schweinf. Ill. Flor. d'Eg. (1887), p. 39 no. 52. — *Malcolmia aegyptiaca* β *aegyptiaca* Coss. Illustr. Flor. Atl. I, p. 23 tab. 55 fig. 16—25. — Plants often perennial, not viscidulous; pods often twice as broad as the pedicel, linear, 15—25 mm long; seeds ovate or oblong, small membranous-margined. — Flow. March.

N. f. D. l. D. a. sept. Not rare in deep sandy places and sometimes on alluvial ground.

Also known from the other parts of the North-Sahara region.

535. (2.) **Malcolmia pygmaea** (Del.) Boiss. Flor. Or. I (1867), p. 222. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 38 no. 50. — Sickenberg. Contrib. Flor. d'Eg., p. 175. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 593 no. 13. — *Hesperis pygmaea* Del. Ill. Flor. d'Eg., p. 19. — 5—10 cm high, many-stemmed, diffuse, ascending, more or less stellate-canescens below. Leaves small, sinuate-toothed or pinnatifid. Flowers small, pale; petals 2 mm long. Pods 2 cm long, 1 mm broad, erect, puberulent; stigma truncate, bilobed. — Flow. March to April.

M. ma. Marmarica: Matruqa; Montaza; Abusîr; Alexandria-West and -East; Mandara; Abukîr, abundantly. — **M. p.** Rosetta; Damietta; Port Said, rare; Qatiya to El-'Arîsh. — **D. i.** Es-Sâlihiya, in deep sand; Wady-el-'Arîsh.

Also known from Palestine.

536. (3.) **Malcolmia torulosa** (Desf.) Boiss. Flor. Or. I (1867), p. 225. — var. **contortuplicata** Boiss. Fl. Or. I, p. 225. — *Sisymbrium torulosum* Desf. Flor. Atl. II, p. 84 tab. 159. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 38 no. 51. — Sickenberg. Contrib. Fl. d'Eg., p. 175. — Annual, 25—30 cm high, sparingly pubescent or hispid with branching hairs and bristles. Leaves oblong, acutely dentate or pectinate-pinnatifid. Flowers 2 mm long, white; pods terete, hirsute, torulose, 3—4 cm long, 1 mm broad, twisted and coiled. — Flow. March to April.

D. i. Wady-el-'Arish. — **D. a. sept.** Northern and Southern Galala, abundantly.

Also known from Palestine.

var. **scorpiuroides** Muschler comb. nov. — *Malcolmia torulosa* var. *leiocarpa* Boiss. Flor. Or. I (1867), p. 225. — *Sisymbrium scorpiuroides* Boiss. Ann. Sc. Nat. (1847), p. 74. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 38 no. 51. — Sickenberg. Contrib., p. 175. — Pods glabrous. Leaves generally scarcely dentate. — Flow. March to April.

M. ma. Mariut.

Also known from Palestine and Syria.

220. (10.) **Sisymbrium** Linn.

Sepals equal or the lateral ones saccate at the base. Petals unguiculate. Siliqua narrow-linear, often elongate, terete or compressed, many-seeded; valves usually faintly 3-nerved. Septum membranous. Persistent style short; stigma undivided or minutely 2-lobed. Seeds in one or sometimes two rows, not bordered, usually oblong or ellipsoidal with short free funicles. — Radicle incumbent. — Usually annual or biennial herbs. Basilar leaves entire, lobed or pinnatifid, often rosulate. Flowers usually yellow or white.

A rather large and very difficult genus, many of the species resembling those of other genera, and often variable. Most of them belong to Europe, Western and Northern Asia, and the Himalaya. A few species occur at the Cape, as well as in America.

A. Valves one-nerved 1. **S. Sophia.**

B. Valves 3-nerved.

I. Sepals ovate 2. **S. Irio.**

II. Sepals linear.

1. Pedicels with bracteoles 3. **S. polyceratum.**

2. Pedicels without bracteoles 4. **S. erysimoides.**

537. (1.) **Sisymbrium Sophia** L. Spec. Plant. I (1753), p. 922. — Boiss. Fl. Or. I, p. 216. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 38

no. 47. — Sickenberg. Contrib. Flor. d'Eg., p. 175. — Fourn. Monogr., p. 60. — *Sisymbrium persicum* Spr. Nov., p. 39. — *Sisymbrium parviflorum* Lam. Fl. Franç. II, p. 519. — An erect, annual plant, 30—45 cm high or rather more, not so coarse as the following, and somewhat hoary with a very short down. Leaves two or three times divided into numerous short linear segments. Flowers small and yellow. Pods slender and glabrous, 18—25 mm long, on slender, spreading pedicels, forming loose, terminal, erect racemes. — Flow. February to March.

M. ma. Ramle recently introduced (Letourneux).

Also known from Europe and Northern Asia, from the Arctic circle to the Mediterranean, the Caucasus, and Himalaya, and in Northern America.

538. (2.) ***Sisymbrium Irio*** L. Amoenit. IV (1761), p. 170. — Spec. Plant. I, p. 921. — Boiss. Fl. Or. I, p. 217. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 38 no. 47. — Sickenberg. Contrib. Flor. d'Eg., p. 175. — Aschers.-Schweinf. Primit. Flor. Marm., p. 593 no. 12. — *Descuraenia Irio* Webb Phytogr. Can. I, p. 73. — *Sisymbrium ramulosum* Poir. Suppl., p. 482. — An erect, annual plant, with a hard stem, 30—50 cm high or more, and glabrous or nearly so. Leaves deeply pinnatifid or pinnate, the lobes or segments lanceolate, more numerous and larger than in *Sisymbrium Sophia*. Flowers small and yellow. Pods on more or less spreading pedicels, 3—5 cm long, often all turned to one side, forming a dense, erect raceme. — Flow. February to March.

M. ma. Marmarica: Matruqa; Bîr-Burdân; Alexandria-West and -East; Mandara. — **M. p.** Rosetta; Damietta; el-'Arîsh. — **N. d.** Damanhur; Er-Rahmaniya; Mehallet-el-Kebîr; Tanta; Zaqaziq; Cairo. — **N. f.** Medinet-el-Fayûm, on alluvial ground; Tamîa; Senhûr; Senûris; abundantly. — **N. v.** Beni-Suêf; Feshn; Minia; Siut; Ekkmîm; Kene; Luksor; Aswân. — **D. a. sept.** Gebel ahmar near Cairo; Galala; Suez.

Local name: figl-el-gemâl; harra (Damietta).

Also known from Central and Southern Europe to the Caucasus.

539. (3.) ***Sisymbrium polyceratum*** L. Spec. Plant. I (1753), p. 918. — Boiss. Fl. Or. I, p. 220. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 38. — Sickenberg. Contrib. Flor. d'Eg., p. 175. — Fourn. Monogr., p. 86. — *Nasturtium polyceratum* Lam. Fl. Franç. II, p. 520. — An annual, erect plant, 20—30 cm high, rarely more, glabrous. Leaves sessile, oblong, cuneate at the base. Flowers small, yellow, aggregate. Pods minute, torulous, subulate; style cylindric. — Flow. March.

D. i. Environs of El-Qantara in sandy places.

Also known from Southern Europe.

540. (4.) **Sisymbrium erysimoides** Desf. Flor. Atlant. II (1798), p. 84 tab. 158. — Boiss. Fl. Or. I, p. 217. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 38 no. 48. — Sickenberg. Contrib. Flor. d'Eg., p. 175. — *Sisymbrium rigidulum* Lag. Nov. Ger., p. 20 not Deesn. — *Pachypodium erysimoides* Webb Phytogr. Can. I, p. 75. — *Sisymbrium nitidum* Zea in Desf. Cat. Hort. Paris, no. 153. — *Sisymbrium Zeae* Spr. Syst. II, p. 904. — Fourn. Monogr., p. 92. — An annual, erect plant, 15—30 cm high or more, nearly glabrous. Leaves runcinate-pinnatifid, lobes oblong, dentate, not auricled at the base. Flowers small, yellow, 2 mm long; calyx somewhat spreading; pods 2—3.5 cm long, 1 mm broad, horizontal, glabrous. — Flow. February to March.

D. a. sept. Gebel ahmar near Cairo; Galala; Wady Azhar; Wady Tin; Suez; allways very scarcely.

Also known from Tunisia, Algeria, Morocco and Southern Spain and Syria.

221. (11.) **Conringia** Reichenb.

Calyx erect, bisaccate. Petals clawed. Pods linear, flattened, or acutely 4-angled; valves 1-nerved. — Annual, glabrous glaucous herbs, with oblong, or elliptical, entire, auricled, clasping stem-leaves, and racemed yellow flowers.

A small genus of only a few species in the Mediterranean region and Europe.

541. **Conringia orientalis** (L.) Andr. in DC. Syst. II (1825), p. 508. — Boiss. Fl. Or. I, p. 210. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 38 no. 46. — *Brassica orientalis* L. Spec. Plant. I, p. 931. — *Erysimum orientale* Jacq. Ic. Austr., tab. 282. — *Erysimum perfoliatum* DC. Syst. II, p. 508. — *Cheiranthus syriacus* DC. Syst. II, p. 485. — An annual, erect plant, 60—70 cm high. Leaves oblong, wavy-margined. Pods 12 cm long, 2 mm broad, spreading, 4-angled; valves somewhat keeled; style tapering; stigma minute, capitate, retuse; seeds rough. — Flow. February to March.

M. ma. Ramle, recently introduced (Letourneux).

Also known from Southern and Middle Europe and the Orient.

222. (12.) **Erysimum** Linn.

Calyx erect, equal at base, or bisaccate. Petals clawed. Pods 4-angled, terete, or flattened, valves 1-nerved or keeled; stigma capitate, retuse, or 2-lobed. — Annual, biennial, or perennial herbs, canescent with appressed, simple, bifid, or branching hairs. Flowers yellow, or purple.

A rather numerous genus in the northern hemisphere, differing from *Cheiranthus* in the seeds, from *Sisymbrium* by the midrib of the valves of the pod being more prominent than in all the species of that genus and by the indument.

542. **Erysimum repandum** L. Spec. Plant. I (1753), p. 923. — Boiss. Fl. Or. I, p. 189. — *Erysimum rigidum* DC. System. II, p. 505. — An annual, erect herb, 15—30 cm high or more, green. Leaves linear or linear-lanceolate, repand-dentate, often recurved at the apex. Pedicels short. Flowers 8 mm long. Pods 4—9 cm long, 1.5—2 mm broad, rough-hairy, spreading, rigid, often torulose; style thick; stigma retuse. — Flow. March.

M. ma. Mandara, recently introduced.

Also known from Syria and Palestine, Eastern Europe and India.

223. (13.) **Brassica** Linn.

Sepals erect or spreading, the lateral ones often saccate at the base. Siliqua linear, elongate or narrow-linear-lanceolate, beaked, beak sometimes 1-seeded; valves costate, with or without lateral nervures; stigma truncate or 2-lobed. Seeds not margined or winged, globose, ellipsoidal or compressed, in one row. Radicle incumbent, more or less sheathed by the conduplicate or concave cotyledons. — Herbs sometimes woody below, glaucous glabrous or pilose-hispid. Radical leaves lyrate or pinnatipartite, rarely nearly entire. Flowers usually yellow.

A large and difficult genus, including several widely cultivated and very variable species, as Cabbage (*B. oleracea*) and Mustard, *B. (Sinapis) alba* and *nigra*.

The species are most numerous in the temperate zone of the Old World. Two or three grow at the Cape.

A. Pods terete, cylindrical or linear flattened.

Beak seedless.

I. Racemes not clustered before flowering.

a) Sparingly hairy; racemes naked . . . 1. **B. nigra**.

b) Glabrous; racemes sometimes leafy . . . 2. **B. bracteolata**.

II. Racemes clustered before flowering . . . 3. **B. rapa**.

B. Pods cylindrical. Beak seed-bearing at the base 4. **B. Tournefortii**.

543. (1.) **Brassica nigra** Koch ap. Mertens and Koch Deutschl. Flor. IV (1833), p. 713. — Boiss. Fl. Or. I, p. 390. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 41 no. 82. — Sickenberg. Contrib. Flor. d'Eg., p. 177. — *Sinapis nigra* L. Spec. Plant. I, p. 933. — Sparingly hairy and sometimes subglabrous, especially in the upper part, but the lower leaves and stem are generally slightly hispid. Stem 60—70 cm

high or more. Leaves mostly deeply divided, with one large terminal ovate or oblong lobe and a few small lateral ones, the upper leaves often small and entire. Flowers small. Pods on short pedicels, closely pressed against the axis of the long slender racemes, glabrous, seldom more than 1 cm long, with a slender style, slightly conical at the base, the valves marked with a strong midrib. — Flow. February to March.

N. d. Abundantly on alluvial ground near Alexandria; Damanhûr; Tanta; Zaqaзиq; Cairo and environ. — **N. f.** Medinet-el-Fayûm; Begîg; El-Hamâm; Tamia; Senhur; Senuris; Kafr Mukfût. — **N. v.** Helwân abundantly, banks of the Nile; Beni Suêf; Abû Fêda; Siut; Luksor; Aswân. — **O.** Siwa; Little Oasis; Great Oasis: En-Nadura; Qasr-el-Goêta; Tomb of Sheyk Khalid Ibn-el-Wêlid. — **D. i.** Bîr Abu Balah; Sâlihîya. — **D. a. sept.** Baths of Helwân; Atfih; Dêr Byâd; Abu Girga; Beni-Hassan; Galala.

Local name: khardal (Delile); khodar (Klunzinger); generally: kabar; lîfsân.

Also known from the other parts of the Mediterranean region and Middle Europe.

544. (2.) **Brassica bracteolata** Fisch. and Mey. in Linnaea XII (1838), p. 153. — Boiss. Fl. Or. I, p. 391. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 41 no. 83. — Sickenberg. Contrib. Flor. d'Eg., p. 177. — An annual erect plant, glabrous. Leaves petioled; the lower ones lyrate, with 1—2 small, lateral segments the terminal one large, oblong, irregularly lobed at the base; the upper ones oblong-linear, entire. Racemes sometimes leafy. Pods 2 cm long, 2 mm broad; beak 4 mm long. — Flow. March to April.

N. d. Shubra near Cairo. — **N. v.** Siut.

Also known from Sinai and Syria.

545. (3.) **Brassica rapa** L. Spec. Plant. I (1753), p. 931. — Boiss. Flor. Or. I, p. 391. — Rehbeh. Ic. II, fig. 4437. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 41 no. 84. — Sickenberg. Contrib. Flor. d'Eg., p. 178. — *Brassica asperifolia* Lam. Encycl. I, p. 746. — A biennial erect plant, 60—70 cm high or more, green. Root-leaves more or less scabrous, lyrate; the upper-ones acuminate, cordate-clasping at the base. Racemes clustered before flowering. Pods 2 cm long, 1.5—2 mm broad; beak 8—10 mm long. — Flow. March to April. — Often escaped from cultivation.

N. d. N. f. N. v. O. Abundantly everywhere on alluvial ground.

Local name: lift; selgam.

Also known from Middle and Southern Europe and the other parts of the Mediterranean region.

546. (4.) **Brassica Tournefortii** Gouan. Illustr. (1773), p. 44 tab. 20 fig. a. — Boiss. Fl. Or. I, p. 393. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 594 no. 21. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 41 no. 85. — Sickenberg. Contrib. Flor. d'Eg., p. 178. — DC. System. II, p. 602. — Erect, usually with spreading branches, shortly hispid below. Radical leaves narrowed to the base; segments patent or slightly recurved, oblong or obovate, toothed, obtuse or acute, sessile; cauline pinnatipartite or much reduced and linear or subulate. Siliques divergent, straight, slightly torulose, often 2—5 cm, exclusive of the straight, 1-seeded beak of 0.5—0.75 cm; valves with a more or less distinct midrib. — Flow. March to April.

M. ma. Marmarica: Matruqa; Abusir; Alexandria-East and -West. — **M. p.** Rosetta; Damietta. — **N. d. N. f. O.** Abundantly on alluvial ground and on the margin of the fields. — **D. i.** Bîr-Abu-Balah. — **D. a. sept.** Helwân; as a weed in fields! Old railway embarkment to Suez.

Local name: fugeyla; figl-el-gemâl; shirtâm (Ascherson).

Also known from Tunisia, Algeria, Southern Spain and Italy, Arabia, Petraea, Palestine and Asia Minor.

224. (14.) **Sinapis** Linn.

Annuals or perennials, either glabrous or with stiff or rough hairs, the lower leaves usually deep pinnate, or lyrate, the upper ones sometimes entire, the flowers yellow. Pod linear, cylindrical or nearly so, more or less beaked at the top beyond the end of the valves, the beak consisting either of the conical style alone, or including a portion of the pod itself, with one or more seeds in it. Seeds globular, ovoid, or somewhat flattened, the cotyledons folded longitudinally over the radicle.

A numerous genus spread over Europe and Northern and Central Asia. Scarcely distinguished from Brassica by the 3-nerved valves of the pods.

A. Pods with conical beak.

I. Glabrous plants 1. **S. juncea.**

II. More or less hirsute plants 2. **S. arvensis.**

B. Pods with long, ensiform, flattened beak 3. **S. alba.**

547. (1.) **Sinapis juncea** L. Spec. Plant. I (1753), p. 934. — Boiss. Fl. Or. I, p. 394. — DC. Syst. II, p. 611. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 41 no. 86. — Sickenberg. Contrib. Flor. d'Eg., p. 178. — Brassica lanceolata Lange Bot. Tidsskr. XVII (1889), p. 170. — Sinapis integrifolia Willd. Hort. Berol., tab. 14. — Brassica Willdenowii Boiss. Ann. Sc. Nat. (1842), p. 88. — Brassica carinata A. Br. in

Journ. Linn. Soc. V, p. 170. — *Brassica juncea* Coss. Comp. Flor. Atl. II, p. 137. — An erect, usually more or less branched herb, attaining 60—90 cm or more, glabrous or minutely setulose below. Lower leaves lyrate-pinnatifid or entire; cauline more or less lanceolate, entire or dentate. Pods usually 2—5 cm long, linear or narrow-linear-lanceolate with a straight, slightly compressed beak; valves with a distinct midrib and more or less obvious, often forking, lateral nerves. — Flow. February to April.

N. d. N. f. N. v. Cultivated abundantly and sometimes naturalized. — **O.** Siwa.

Local name: kabar; khardal.

Extends from Southern Europe to China. It is cultivated everywhere for its soil. It is also used often as a salad.

548. (2.) **Sinapis arvensis** L. Spec. Plant. I (1753), p. 933. — Boiss. Fl. Or. I, p. 394. — Rehb. Ic. II, fig. 4425. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 41 no. 87. — Sickenberg. Contrib. Flor. d'Eg., p. 178. — *Sinapis taurica* DC. System. II, p. 617 not M. B. — An annual erect herb, 60—100 cm high or more, more or less hirsute. Leaves ovate, unequally dentate, basilar sometimes lyrate. Pods 3—5 cm long, 2—3 mm broad, erect, or slightly spreading; beak often as long as the rest of the pod. — Flow. February to April.

M. ma. Abusir; Alexandria-West and -East; Mandara; Abukir, abundantly. — **N. d. N. v.** Common in fields and waste places. — **O.** Little Oasis; Dakhel; Great Oasis. — **D. a. sept.** Ajûn Mûsa near Suez.

Local name: qerillah; khardal; kabar afrîr (Ascherson).

Also known from all the other parts of the Mediterranean region, Middle and Northern Europe, Mesopotamia and Turkestan.

var. **turgida** (Del.) Ascherson and Schweinf. in Engler's Bot. Jahrb. (1884), p. 200. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 41 no. 86. — Sickenberg. Contrib. Flor. d'Eg., p. 178. — *Sinapis turgida* Del. Illustr. Flor. d'Eg., no. 606 tab. XXXV. — *Sinapis Allionii* β *turgida* Boiss. Fl. Or. I, p. 395. — Valves nervous-reticulate. — Flow. February to March.

M. ma. N. d. N. v. O. Abundantly in fields and waste places.

Local name: khardal.

Only known from Egypt.

var. **Allionii** (Jacq.) Ascherson and Schweinf. in Engler's Bot. Jahrb. (1884), p. 200. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 41 no. 87. — Sickenberg. Contrib. Flor. d'Eg., p. 178. — *Sinapis Allionii* Jacq. Hort. Vind. II, tab. 168. — Boiss. Fl. Or. I, p. 395. — Glabrous,

leaves pinnatipartite, segments laciniate or dentate; pods glabrous, short, ovate or ovate-oblong. — Flow. March.

N. d. N. f. N. v. Abundantly in flax-fields.

Local name: qerilleh (Schweinfurth).

549. (3.) **Sinapis alba** L. Spec. Plant. I (1753), p. 933. — Boiss. Fl. Or. I, p. 395. — Rehb. Ic. II, fig. 4424. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 42 no. 88. — Sickenberg. Contrib. Flor. d'Eg., p. 178. — *Sinapis foliosa* Willd. Enum. Plant. Hort. Berol., p. 688. — Stem 30—60 cm high or more, glabrous, or with spreading, stiff hairs. Leaves pinnately lobed or divided, more or less rough, the lobes ovate or oblong, coarsely toothed, the terminal one the largest. Flowers rather large, fruit-pedicels spreading. Pod 1—2.5 cm long, but more than half occupied by a stout flattened beak, often curved, with a single seed in its base, the valves and lower part of the beak very hispid with stiff white hairs concealing the prominent nerves. — Flow. March to April.

M. ma. Alexandria, bords of the canal; Abukîr. — **N. d.** Rosetta; Berimbal (Ascherson); Tanta (Pfund).

Local name: kabar.

Also known from the other parts of the Mediterranean region, Middle Europe, Mesopotamia, Persia, Turkestan, Afghanistan and India.

225. (15.) **Diplotaxis.**

Sepals at length spreading. Siliques linear, sometimes elongate, compressed, without or sometimes with (as in the following species) a short 1-seeded beak; valves with a slender median nerve; septum membranous. Seeds numerous, in two rows, ellipsoidal or globose. Cotyledons conduplicate. — Herbs with the general aspect of *Brassica* and scarcely distinguishable excepting by the more distinctly biseriate seeds.

A genus of about 25 species, chiefly natives of Western Asia, Europe and Northern Africa.

A. Flowers yellow **D. Harra.**

B. Flowers lilac-pink, or white.

I. Leaves runcinate-lyrate **D. eruroides.**

II. Leaves oblong or ovate **D. acris.**

550. (1.) **Diplotaxis Harra** Boiss. Flor. Or. I (1867), p. 388. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 41 no. 79. — Sickenberg. Contrib. Flor. d'Eg., p. 177. — Aschers.-Schweinf. Primit. Flor. Marmarie., p. 593 no. 19. — Aschers. Flor. Rhinocol., p. 791 no. 30. — *Sinapis*

Harra Forsk. Flor. aeg.-arab., p. 118. — *Sisymbrium pendulum* Desf. Flor. Atl. II, p. 82 tab. 156. — *Diplotaxis pendula* DC. System. II, p. 630. — An perennial erect herb, 20—40 cm high, hispid, rarely glabrescent; stems multiple, branching, often woody at the base. Leaves obovate-oblong, coarsely-toothed. Pedicels longer than the flower, slender, often deflexed. Pods stipitate, 4—5 cm long, 2—3 mm broad, with broad, sessile bilobed stigma. — Flow. February to March and April.

M. ma. Alexandria-West. — **D. l. D. i. D. a. sept.** Abundantly on sandy places.

Local name: harrah.

Also known from Sicily, Spain, Morocco, Algeria, Tunisia, Tripolitania, Syria, Palestine and Arabia.

551. (2.) ***Diplotaxis eruroides*** DC. Syst. II (1825), p. 631. — Boiss. Fl. Or. I, p. 388. — Rehb. Ic. II, fig. 4422. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 41 no. 80. — Sickenberg. Contrib. Flor. d'Eg., p. 177. — *Sinapis eruroides* L. Moenit. IV, p. 322. — An annual erect herb, 30—60 cm high, sparingly papillose-hairy; stems branched from the base and above. Leaves runcinate-lyrate, dentate, uppermost oblong, dentate. Pedicels about as long as the flowers. Pods ascending, 2—4 cm long, 2 mm broad, style 3 mm long; stigma bilobed. — Flow. January to April.

M. ma. Abusir; Mariut; Alexandria-West and -East; Mandara; Abukir, sandy places. — **N. d.** Abundantly Kafr Dowar; Zaqaziq; Qalyub; Cairo and environs.

Also known from all the other parts of the Mediterranean region, Spain, Asia Minor, Palestine and Syria.

552. (3.) ***Diplotaxis acris*** (Forsk.) Boiss. Flor. Or. I (1867), p. 389. — Aschers.-Schweinf. Primit. Flor. Marmarie., p. 593 no. 19. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 41 no. 81. — Sickenberg. Contrib. Flor. d'Eg., p. 177. — Aschers. Florul. Rhinocol., p. 791 no. 30. — *Hesperis acris* Forsk. Flor. aeg.-arab., p. 118. — Delile Illustr. Flor. d'Eg., p. 131 tab. 35 fig. 2. — An annual erect herb, 10 cm high, sparingly hairy or glabrescent. Leaves oblong or obovate, dentate, obtuse. Pedicels ascending, about as long as the flower; flowers 13 mm long. Pods erect, short stipitate, 2—3.5 cm long, 2—3 mm broad; stigma sessile, truncate. — Flow. December to March.

D. i. D. a. sept. D. a. mer. A common plant in deep sandy places.

Local name: yehâg (Schweinfurth); meddâd; safiry.

Also known from Arabia Petraea and Palestine.

226. (16.) **Moricandia** DC.

Calyx erect, bisaccate. Petals clawed. Pod linear, more or less flattened; valves keeled, 1—3-nerved. Seeds in 1 or 2 rows. — Glabrous herbs, with large pinkish-purple flowers.

A small genus of only a few species in the Mediterranean region.

A. Leaves undivided, the upper cordate auricled, clasping at the base. Pods somewhat 4-angled. Valves 1-nerved.

I. Leaves obovate to ovate 1. **M. sinaica**.

II. Leaves oblong 2. **M. nitens**.

B. Leaves bipinnatisect. Pods flattened. Valves obsoletely

3-nerved 3. **M. clavata**.

553. (1.) **Moricandia sinaica** Boiss. in Boiss. Flor. Or. I (1867), p. 386. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 40 no. 76. — Sickenberg. Contrib. Flor. d'Eg., p. 176. — *Brassica sinaica* Boiss. in Ann. Scienc. Nat. (1842), p. 85. — Biennial or perennial. Leaves 1—2 cm long, oblong to obovate, the lower tapering at the base. Pods 5—7 cm long, 2—3 mm broad; seeds in 2 rows. — Flow. February to March

D. a. sept. Wady Rished near Helwan; Wady Abu-Marwa.

Local name: khusiân-el-Janâl.

Also known from Sinai.

554. (2.) **Moricandia nitens** Durand and Batt. in Flor. Libyc. Prodrom. (1910), p. 15. — *Moricandia dumosa* Boiss. Diagn. Plant. Or. Ser. I fasc. VIII, p. 25. — Flor. Or. I, p. 386. — *Moricandia divaricata* Coss. ap. Kral. Plant. alger. exsicc. — Coss. in Ill. Fl. Atl. I, p. 35 tab. 25. — Coss. Compend. II, p. 158. — *Moricandia spinosa* Pomel Nouv. mat., p. 365. — *Moricandia suffruticosa* var. *nitens* Ascherson and Schweinf. Illustr. Flor. d'Eg., p. 41. — Sickenberg. Contrib. Flor. d'Eg., p. 177. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 593 no. 18. — Aschers. Flor. Rhinocol., p. 790 no. 28. — *Hesperis nitens* Viv. Flor. Libyc., p. 38 tab. 5 fig. 3. — An perennial erect plant, 60 cm high or more. Leaves 1—2.5 cm long, oblong; the lower ones and those of the sterile branches often repand-dentate, with acuneate base. Pods 4—6 cm long, 1—2 mm broad; seeds nearly in one row. — Flow. February to March and April.

M. ma. Marmarica; Matruqa; Ras-el-Kenâ'is; Alexandria-East. — **M. p.** Rosetta; el-'Arish. — **D. i.** Wady-el-'Arish. — **D. a. sept.** Helwân, on calcareous ground.

Local name: fudjeyla (Ascherson); hamîma.

Also known from Algeria, Tripolitania, Cyrenaica and Northern Arabia Petraea.

555. (3.) **Moricandia clavata** Boiss. and Reut. ap. Boiss. Diagn. Plant. Orient. ser. 2 fasc. V (1856), p. 25. — Flor. Or. I, p. 387. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 41 no. 78. — Coss. Compend. II, p. 159. — Sickenberg. Contrib. Flor. d'Eg., p. 177. — An annual erect herb, 10—20 cm high, sometimes more. Leaves 1—2 cm long, bipinnatisect, fleshy; stem flexuous, branching from the base. Lobes of the leaves linear, somewhat terete. Pods 2 cm long, 1 mm to 2 mm broad; seeds in 2 rows. — Flow. February to April.

D. I. Abu-Roash near Cairo. — **D. a. sept.** Abundantly on calcareous ground.

Local name: hamîma.

Also known from Tripolitania and Arabia Petraea.

227. (17.) **Eruca** DC.

Sepals erect, nearly equal at the base. Siliques oblong-linear, turgid, subterete, with a compressed, seedless, sword-like beak; valves convex with a distinct median nerve; septum membranous; stigma obtuse, undivided. Seeds numerous, biseriate or sub-biseriate, with free funicles; embryo with conduplicate cotyledons. — Erect branched annuals or biennials. Leaves lyrate or pinnatifid. Racemes ebracteate.

A small genus of Southern Europe, the Mediterranean, and Western Asia.

556. **Eruca sativa** Lam. Flor. Franc. II (1778), p. 496. — Boiss. Fl. Or. I, p. 396. — Rehbch. Ic. II, fig. 4421. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 41 no. 89. — Sickenberg. Contrib. Flor. d'Eg., p. 180. — *Eruca stenocarpa* Boiss. and Reut. Pug., p. 8. — *Brassica Eruca* L. Spec. Plant. I, p. 932. — DC. Syst. II, p. 637. — An erect, branched, glabrous, or more or less hispid herb of 60—65 cm or more. Leaves lyrate-pinnatifid, or obovate to oblanceolate more or less pinnately toothed or sinuate; upper leaves petiolate, usually toothed. Flowers tolerably large, white or yellow, dark veined. Siliques erect, on short pedicels; valves about 2—3 cm long or less, exceeding or equalling the beak. — Flow. December to April.

M. ma. M. p. N. d. N. f. N. v. O. D. a. sept. D. a. mer. Cultivated and naturalized.

Local name: shiltâm (Roth); 'afin (Ascherson); gery (Klunz.); generally: gergîr.

Also known from all the other parts of the Mediterranean region, Middle Europe, Mesopotamia, Persia and India.

228. (18.) **Savignya** DC.

Calyx erect, equal. Pod stipitate, elliptical, with chartaceous valves; septum with 2 layers. Stigma simple. Seeds in 2 rows,

winged, with half-adnate funicles. — Viscid, glabrous, or sparingly hairy divaricately branched, desert herbs, with small pale pink flowers.

A small genus widely distributed in the Desert region.

557. **Savignya parviflora** (Del.) Webb Fragm. aeg. (1854). p. 47. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 42 no. 90. — Sickenberg. Contrib. Flor. d'Eg., p. 180. — *Savignya aegyptiaca* DC. Syst. II, p. 283. — Boiss. Flor. Or. I, p. 397. — Aschers. Florul. Rhinoc., p. 791 no. 31. — *Lunaria parviflora* Del. Flor. aeg. Illustr., no. 584. — An annual erect plant, 10—15 cm high. Leaves fleshy, the lower ones obovate-oblong, dentate, petioled; the upper one linear, pinnatifid or entire. Pods on filiform spreading pedicels twice their length; style apiculate. — Flow. January to May.

O. Dakhel. — **D. i.** Beni-Selâma, in deep sand; Abû-Ghalile; Kafr Hakîm, in sandy places; Abu Roash. — **D. i.** Wady-el-'Arish; Desert-el-Tih; Es-Sâlihiya in deep sandy places; Ismailia; Ramses-Station. — **D. a. sept.** Abundantly on calcareous ground.

Local name: reshâd gebely (Delile).

Also known from Tripolitania, Arabia Petraea, Mesopotamia and Arabia Petraea.

229. (19.) **Carrichtera** DC.

Calyx erect, equal at the base. Petals clawed, entire. Pod globular-ovate; style flattened, spoon-shaped, ovate, leaflike; cells 4-ovuled. — Dwarf annuals, with small cream-coloured, violet-veined petals.

A small genus in the Mediterranean region.

558. **Carrichtera annua** (L.) Aschers. Ind. Sem. Hort. Berol. (1866). p. 13. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 42 no. 91. — Sickenberg. Contrib. Flor. d'Eg., p. 180. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 594 no. 22. — Aschers. Flor. Rhinocol., p. 791 no. 32. — *Carrichtera Vellae* DC. System. II, p. 641. — *Vella annua* L. Spec. Plant. I, p. 895. — An annual, erect herb, 10—30 cm high or more, glabrous, or slightly hairy, dichotomous from the base. Leaves pinnati- or bipinnatisect into linear lobes. Terminal or leaf-opposed racemes; pods short, turgid, few-seeded, with dilated beaks as long as their valves. — Flow. January to May.

M. ma. Marmarica: Matruqa; Abusîr; Mariut; Alexandria-West and -East; Mandara on calcareous ground. — **M. p.** Rosetta. — **N. d.** Damanhûr; Zaqaziq; environs of Cairo. — **D. i.** Wady-el-'Arish;

el-Grady; Wady-el-Hagg. — **D. l.** Abu Roash; Pyramids of Giza.
— **D. a. sept.** Northern Galala: Wady Khafūra.

Local name: qinêbra; geleyqela (Ascherson).

Also known from the other parts of the Mediterranean region, Mesopotamia and Persia.

230. (20.) **Schouwia** DC.

Sepals suberect, lateral broader. Siliqua elliptical, emarginate or cordate at the base, much compressed laterally with a narrow septum, margins winged. Style persistent, elongate, subulate. Seeds indefinite. Cotyledons conduplicate. — Glabrous branching herbs. Leaves entire. Cauline amplexicaul. Racemes narrow, elongate, ebracteate. — Flowers purple.

A small genus of the desert regions bordering the Red Sea.

559. **Schouwia purpurea** (Forsk.) Muschler comb. nov. — var. **Schimperi** Muschler. — *Schouwia arabica* DC. var. *Schimperi* Aschers. and Schweinf. in Aschers.-Schweinf. Ill. Flor. d'Eg., p. 42 no. 92. — Sickenberg. Contrib. Flor. d'Eg., p. 180. — *Subularia purpurea* Forsk. Flor. aeg.-arab., p. 117. — *Thlaspi arabica* Vahl Symb. II, p. 76. — *Schouwia arabica* DC. System. II, p. 644. — *Schouwia brassicaefolia* Jaub. and Spach Ill. Plant. Or., tab. 296. — *Schouwia Schimper* Jaub. and Spach. Ill. Plant. Or. III, p. 145. — *Schouwia thebaica* Webb in Giorn. Bot. Ital. vol. II, p. 219. — An erect annual plant, 25—50 cm high or more. Cauline leaves elliptic-oblong, broadly pinnate or obtuse, sessile, with a deeply cordate or auricled amplexicaul base. Racemes 15—30 cm or longer. Pods 1—2 cm long, 2—5 mm broad, much exceeding the ascending pedicel. — Flow. February to April.

D. l. Between Gebel Gara' and Biban; Sahag; Khor of Battaqah; Wady Abad; Esne; between Erna and the Great Oasis. — **D. a. mer.** Qoseyr.

Local name: mahad; nam-nam (Schweinfurth).

Also known from Arabia and Tropical Africa.

231. (21.) **Farsetia** Desv.

Calyx equal at base. Petals clawed, with oblong-linear limb. Silicle canescent (in ours) oblong, ovate, or elliptical; stigma 2-lobed. Seeds in 2 rows, flattened, broadly winged. — Low shrubby canescent plants, with forked hairs, purplish flowers, and linear, entire leaves.

A genus of 20—30 species, inhabiting the shores of the Mediterranean, Western Asia to Northern India and Northern Africa.

A. Pods linear.

I. Margins straight; flowers distant, in spicate

racemes 1. *F. longisiliqua*.II. Margins undulate; flowers densely spicate 2. *F. ramosissima*.B. Pods elliptic-oblong 3. *F. aegyptiaca*.

560. (1.) **Farsetia longisiliqua** Decsne in Ann. Scienc. Nat. sér. 2 vol. IV (1835), p. 69. — Boiss. Flor. Or. I, p. 157. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 38 no. 38. — Sickenberg. Contrib. Flor. d'Eg., p. 175. — Suffrutescent, hoary with closely appressed white hairs; branches slender, rather rigid, divaricate. Leaves very narrow-linear. Flowers rather distant, in narrow, spicate racemes; buds oblong. Pedicels at length 1.5—5 mm, appressed or ascending. Pods 2.5 cm more or less, slightly curved outwards, linear, 2—4 mm broad; valves hoary, undulate, with a faint midrib. Persistent style about 2.5 mm long. — Flow. March to April.

D. a. mer. Wady Gemâl; Wady Sekhuma.

Also known from Nubia, Tropical Africa and Arabia.

561. (2.) **Farsetia ramosissima** Hochst. in Kotschy Plant. Nub. (1864), p. 43. — Fourn. in Bull. Soc. Bot. Franc. VI (1864), p. 57. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 38 no. 39. — Sickenberg. Contrib. Flor. d'Eg., p. 175. — Suffrutescent, hoary with closely appressed white hairs; branches divaricate. Leaves linear-lanceolate. Flowers densely spicate; buds oblong. Pedicels at length 1—2 mm long, appressed or sometimes ascending. Pods short, appressed, more or less slightly curved outwards; valves hoary. — Flow. March to April.

D. l. Khor Battagha. — **D. a. sept.** Between Turra and Helwân. — **D. a. mer.** Qoseyr.

Also known from Tropical Africa.

562. (3.) **Farsetia aegyptiaca** Turra Farset. I (1765), tab. 1. — Boiss. Flor. Or. I, p. 158. — Coss. Comp. II, p. 227. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 38 no. 40. — Sickenberg. Contrib. Flor. d'Eg., p. 175. — Cheiranthus Farsetia L. Mant., p. 94. — Desf. Flor. Atlant. II, p. 89 tab. 160. — Shrubby, 40—50 cm high, with repeatedly forking, rigid, terete branches, hoary with closely appressed hairs. Leaves linear, hoary. Racemes strict, with subdistant flowers; pedicels usually from 2 to, at length, 8 mm. Calyx 1 cm; sepals somewhat connivent above. Pods broadly oblong-elliptical, hoary, ascending, about 1.5 cm long. — Flow. December to March.

D. l. **D. i.** **D. a. sept.** **D. a. mer.** Abundantly in deep sand and on calcareous ground.

Local name: garba (Forsk.); haïfal (Ehrenberg); melekiya (Ehrenberg); murreyr (Roth); goreyby (Wilkinson); goreibiyeh (Schweinfurth).

Also known from Morocco, Algeria, Tunisia, Tripolitania, Syria, Arabia Petraea, India.

232. (22.) **Fibigia** Medik.

Calyx bisaccate or equal at the base. Petals clawed; limb oblong, entire. Silicles hirsute, elliptical or orbicular, sometimes obovate, flattened, 2-celled; septum nerveless, with fine transverse veins. Stigma minute, capitate. Seeds in 2 rows, flattened, winged. — Perennial herbs or low shrubs tomentose, with stellate hairs. Flowers racemose-spiked (ours) yellow.

A small genus in the Mediterranean region.

563. **Fibigia clypeata** (L.) Boiss. Flor. Or. I (1867), p. 257. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 39 no. 54. — *Alyssum clypeatum* L. Spec. Plant. I, p. 909. — *Farsetia clypeata* R. Br. in Ait. Hort. Kew. IV, p. 96. — *Farsetia cheiranthifolia* Desv. Journ. Bot. III, p. 173. — *Alyssum cheiranthifolium* Willd. Enum. Plant., p. 218. — A perennial erect herb, 40—80 cm high or more. Undermost and lower stem-leaves oblong spatulate, upper ones oblong, or oblong-linear, all entire or repand. Silicles elliptical, ovate-elliptical, to obovate-elliptical; style apiculate; seeds 3—8, usually broader than the wing. — Flow. March to April.

D. a. sept. Wady Rished near Helwân.

Also known from Sinai, Syria and Palestine.

var. **rostrata** (Schenk) Fourn. Rech. anat. Fam. Crucif. (1865), p. 13. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 39 no. 54. — *Fibigia rostrata* Boiss. Fl. Or. I, p. 257. — *Farsetia rostrata* Schenk Plant. Specim., p. 42. — Style half or one-third as long as the breadth of the pod. — Flow. December to March.

D. a. sept. Gebel ahmar near Cairo; Wady Dugla; Wady Hof; Gebel Hof, abundantly on stony ground. — **D. a. mer.** Qoseyr.

Also known from Sinai and Palestine.

233. (23.) **Lobularia** Desv.

Perennial or annual herbs, pubescent or canescent with forked hairs, with entire leaves and small white flowers in terminal racemes. Petals obovate, entire. Filaments slender, with 2 small glands at the base. Capsule compressed, oval or orbicular. Seeds 1 in each cell. Cotyledons accumbent.

A small genus of only a few species in the Mediterranean region.

A. Perennial. Leaves acute 1. *L. maritima*.

B. Annual. Leaves obtuse.

I. Leaves linear-lanceolate; cells 4—5-seeded . . . 2. *L. libyca*.

II. Leaves oblong-spathulate; cells 1—2-seeded . . . 3. *L. arabica*.

564. (1.) **Lobularia maritima** Desv. Journ. Bot. III (1813), p. 162. — Koniga *maritima* R. Br. in Observ. Plant. collect. Oudney, p. 9. — Boiss. Fl. Or. I, p. 289. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 39 no. 56. — Sickenberg. Contrib. Flor. d'Eg., p. 176. — Ascherson-Schweinf. Primit. Flor. Marmar., p. 593 no. 14. — *Clypeola maritima* L. Mant., p. 426. — Ascending or sometimes procumbent, freely branching, 1—3 dm high, minutely pubescent with appressed hairs; basal leaves oblanceolate, narrowed into a petiole; flowers white, fragrant, about 4 mm broad; fruiting pedicels ascending, 6—8 mm long; silicles glabrous, pointed, oval or nearly orbicular, 2—3 mm long. — Flowering nearly throughout the year.

M. ma. Marmarica: Matruqa; Montaza; Alexandria-West and -East, on sandy hills and places. — **N. d. N. v.** An escape from gardens, along streets and in waste places.

Local name: dakhîyân.

All the parts of the Mediterranean region, except Asia Minor.

565. (2.) **Lobularia libyca** Webb Phyt. Can. I (1836), p. 90. — Koniga *libyca* R. Br. Observ. Plant. collect. Oudney, p. 8. — Boiss. Flor. Or. I, p. 289. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 39 no. 57. — Aschers. Flor. Rhinocol., p. 790 no. 20. — Sickenberg. Contrib. Flor. d'Eg., p. 176. — Lunaria *libyca* Viv. Flor. Libyc., p. 34 tab. 16 fig. 1. — An annual, erect plant, or prostrate. Leaves lanceolate-linear, obtuse, silicles beset with 2-parted hairs; cells 4—5-seeded. — Flow. October to March.

M. ma. Abusîr; Montaza; Mariut; Brullus; Alexandria-West and -East; Mandara; Abukîr. — **M. p.** Rosetta; Damietta in deep sand; El-Grâdy; El-Kharûab. — **D. i.** Es-Sâlihîya; Ismailia; Ramses.

Local name: khurm-el-ibrah (Ascherson).

Also known from Southern Spain, Morocco, Algeria, Tunisia, Tripolitania, Arabia Petraea and Persia.

566. (3.) **Lobularia arabica** (Boiss.) Muschler comb. nov. — Koniga *arabica* Boiss. Diagn. Plant. Orient. Ser. I fasc. VIII, p. 26. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 39 no. 58. — Sickenberg. Contrib. Flor. d'Eg., p. 175. — Aschers. Flor. Rhinocol., p. 790 no. 22. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 593 no. 14. — Boiss. Fl. Or. I, p. 290. — An annual prostrate herb. Leaves oblong-spathulate or linear, obtuse, tapering into a petiole. Silicles sparingly hairy; cells 1—2-seeded. — Flow. January to March.

M. ma. Marmarica: Matruqa; Mariut; Brullus; Alexandria-East and -West; Mandara. — **M. p.** Qatiya to el-'Arish.

Local name: khurm-el-ibra (Ascherson-Muschler).

Also known from Arabia and Palestine.

234. (24.) *Alyssum* Tourn.

Annuals or low branching perennials, with a hoary or short stellate down, and white or yellow flowers. Filaments of the stamens, or the shorter ones only, usually winged near the base, or thickened, or furnished with small teeth. Pod sessile within the calyx, orbicular or oval, the partition broad, the valves convex, and not veined. Seeds 1—4, or very rarely more, in each cell. Radicle accumbent on the edge of the cotyledons.

A genus of about 40—50 species in Central and Southern Europe and Asia.

A. Silicles unequally convex; cells 2-ovuled.

Filaments winged, toothed or appendaged 1. **A. minimum.**

B. Silicles convex; cells 2-ovuled. Filaments

toothless 2. **A. homalocarpum.**

567. (1.) ***Alyssum minimum*** Willd. Spec. Plant. III (1807), p. 464. — Boiss. Flor. Or. I. p. 281. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 39. — An annual herb, 10—15 cm high or more, canescent-scurfy, dwarf, branching from the base. Leaves oblong-linear. Petals linear, retuse. Fruiting raceme elongated, dense; pedicels erect; silicles glabrous, orbicular, 2.5 mm long retuse; style one-sixth to one-fourth as long as the pod; seeds narrowly margined. — Flow. January to March.

M. ma. Alexandria, near the quai, naturalized (Blomfield).

Also known from Syria and Palestine.

568. (2.) ***Alyssum homalocarpum*** (Fisch. and Mey.) Boiss. Flor. Or. I (1867), p. 285. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 39 no. 55. — *Psilonema homalocarpa* Fisch. and Mey. Ind. Hort. Petrop. VI, p. 21. — *Alyssum horebicum* Boiss. Ann. Scienc. Natur. (1842), p. 156. — An annual, erect herb, 10—30 cm high or more, branching from the base, canescent. Leaves lanceolate all silvery. Flowers very small, petals spatulate-cuneate, yellow glabrous shorter than the calyx. Fruiting raceme loose, 5—6 cm long; silicles orbicular, retuse 3 mm long with a flattened margin; style almost 0; seeds narrowly margined. — Flow. February to April.

M. p. El-'Arish (Figari). — **D. a. sept.** Galâla.

Also known from Arabia Petraea.

235. (25.) **Leptaleum** DC.

Sepals linear, erect, equal at the base. Petals linear. Longer stamens long-connate in pairs, often reduced by abortion to two. Pod nearly indehiscent, linear, somewhat flattened; valves 1-nerved, reticulate; lobes of stigma connate in a minute cone. — Annual, dwarf, white-flowered herbs.

A small genus in the Eastern Mediterranean region.

569. **Leptaleum filifolium** DC. Syst. II (1825), p. 511. — Boiss. Flor. Or. I, p. 243. — Deless. Ic. II, tab. 68. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 39 no. 53. — *Leptaleum pygmaeum* DC. Syst. II, p. 511. — An annual, erect plant, 3—10 cm high or more, glabrous, divaricately branched. Leaves thread-shaped undivided, or pinnatifid with filiform lobes. Flowers 5 mm long, sessile, axillary. Pods 2 cm long, 2 mm broad. — Flow. January to April.

D. a. sept. Southern and Northern Galâla on calcareous ground.

Local name: qeseysa.

Also known from Arabia Petraea, Turkestan.

236. (26.) **Camelina** Crantz.

Calyx nearly equal at the base. Petals entire, oblong-linear, tapering from the top to the base. Filaments free, toothless. Pod an ovate, obovate, or orbicular silicle, or a linear-cylindrical siliqua, with keeled margins; valves turgid, indurated; stigma simple; seeds in two rows, rarely in one. — Annual herbs, glabrous or hispid with forked hairs. Flowers yellow. Root-leaves oblong, stem-leaves oblong-lanceolate, sagittate-auriculate.

A small genus in the Mediterranean region and Europe.

570. **Camelina hispida** Boiss. in Ann. Scienc. Natur. (1842). p. 176. — Boiss. Flor. Or. I, p. 302. — An annual, erect herb, 35—50 cm high or more. Patulous-hispid. Leaves dentate or repand. Fruiting racemes 15—25 cm, loose. Pedicels spreading, once and a half to twice as long as glabrous, margined, 3 mm long pods; style as long as pod, or longer. — Flow. March to April.

M. ma. Alexandria; Qai 1880 (Blomfield).

Also known from Armenia and Arabia Petraea.

237. (27.) **Capsella** Medik.

Erect annual herbs, pubescent with forked hairs. Basal leaves tufted. Flowers racemose, small, white. Sepals spreading, equal at the base. Petals short. Silicles cuneate-obcordate, obcompressed,

the valves keeled. Style short. Seeds numerous in each cell, marginless. Cotyledons accumbent.

A small genus, scattered over the temperate regions of both hemispheres.

- A. Silicles triangular-obcordate 1. *C. bursa pastoris*.
B. Silicles ovate, obtuse or subtruncate 2. *C. procumbens*.

571. (1.) **Capsella bursa-pastoris** Moench Method. (1794), p. 271. — Boiss. Flor. Or. I. p. 340. — Rehbch. Ic. II, fig. 4229. — *Thlaspi bursa-pastoris* L. Spec. plant. I. p. 903. — Erect, branching, 15—40 cm high, pubescent below, mostly glabrous above; basal leaves lobed or pinnatifid, forming a rosette, 5—12 cm long; cauline leaves few, lanceolate, auricled, dentate or entire; flowers 2 mm broad; pedicels slender, spreading or ascending, 10—14 mm long in fruit; pods triangular, more or less deeply emarginate at the apex, rarely truncate, 4—6 mm long. — Flow. February to March.

N. d. Cairo; Heliopolis in fields; recently introduced.

All the the parts of the Mediterranean region and Europe.

572. (2.) **Capsella procumbens** (L.) Fries. Nov. Flor. Succ. Mant. I (1832), p. 14. — Boiss. Flor. Or. I. p. 340. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 39 no. 62. — Sickenberg. Contrib. Flor. d'Eg., p. 175. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 593 no. 16. — *Lepidium procumbens* L. Spec. Plant. I. p. 898. — An annual herb, dwarf. Leaves pinnatipartite into elliptical or lanceolate lobes, or sometimes undivided. Silicles ovate, obtuse or subtruncate. — Flow. March.

M. ma. Marmarica. — **N. d.** Alexandria.

Also known from the other parts of the Mediterranean region (except Morocco and Palestine), Middle Europe, Mesopotamia, Persia and Central Asia.

238. (28.) **Lepidium** L.

Erect or spreading, glabrous or pubescent, annual or perennial herbs, sometimes almost shrubby. Leaves entire or divided. Flowers small, white, ebracteate. Sepals short, equal at the base. Petals short, equal sometimes wanting. Stamens often reduced to 4 or 2. Pods variable, oblong, ovate, obcordate, or orbicular, much compressed laterally, notched at the summit or entire, winged or not; septum narrow, membranous. Seeds one in each cell, suspended from the top of the septum; cotyledons incumbent.

A large genus of nearly 120 species, found in most temperate or warm climates. The Egyptian species are highly variable, and several are very difficult of discrimination.

- A. Silicles ovate or oblong, notched, winged; style free 1. **L. sativum**.
 B. Silicles ovate or oblong, notched; wings adherent
 to the style 2. **L. Aucheri**.
 C. Silicles transversally ovate, 2—3 mm long, wingless 3. **L. Draba**.
 D. Silicles ovate to elliptical, 1—3 mm long, wingless 4. **L. latifolium**.

573. (1.) **Lepidium sativum** L. Spec. Plant. I (1753), p. 644.
 — Thellung in Vierteljahr. d. zür. naturf. Gesell. LI, p. 159. — DC.
 Syst. II, p. 533. — Boiss. Flor. Or. I, p. 354. — Aschers.-Schweinf.
 Ill. Flor. d'Eg., p. 39 no. 63. — Sickenberg. Contrib. Flor. d'Eg., p. 176.
 — Thlaspi sativum Crantz Stirp. Austr. I, p. 21. — Nasturtium sativum
 Medik Pflzngattg., p. 81. — Thlaspidium sativum Spach Hist. vég.
 Phan. VI, p. 557. — Lepidium hortense Forsk. Flor. aeg.-arab.,
 p. LXIX no. 311. — Delile Flor. Aeg. Ill., p. 19. — Thlaspi Nasturtium
 Berg. ex Desv. Journ. Bot. III, p. 165. — An erect glabrous annual.
 Leaves entire or variously lobed or pinnatisect, often with linear
 segments; the lower petiolate, the upper linear or linear-oblong,
 sessile. Silicles obovate-or broadly elliptico-rotundate, emarginate
 (occasionally with 3 valves), slightly but thickly winged above. —
 Flow. Dezember to March.

N. d. N. f. N. v. O. Everywhere cultivated, and often as a weed
 of waste places.

Local name: reshâd; habb-er-reshâd (Schweinfurth).

Also known from all the other parts of the Mediterranean region; origin
 unknown, probably Western Asia.

574. (2.) **Lepidium Aucheri** Boiss. in Ann. Scienc. natur. ser. 2
 vol. XVII (1842), p. 195. — Flor. Or. I, p. 354. — Aschers.-Schweinf.
 Ill. Flor. d'Eg., p. 40 no. 64. — O. Kuntze in Act. Hort. Petrop. X. 1
 (1887), p. 166. — Nasturtium Aucheri O. Kuntze Revis. Gen. Plantar. I,
 p. 973. — Lepidium babylonicum Auch. ined. in herb. Thellung Monogr.
 Gattg. Lepidium, p. 120. — Lepidium Kaji Post ined. in Herb. Barb.
 Boiss. — Annual. Sparingly stellate-puberulent, prostrate; stems
 diffuse, 15—30 cm long. Lower-leaves oblong, 3—4 cm long, pinna-
 tely divided into oblong, obtusely lobed or toothed segments; upper
 ones oblong, tapering at the base, sparingly toothed or entire. Racemes
 axillary or terminal, compact in flower, loose in fruit, 10—15 cm
 long; pedicels spreading in flower, appressed in fruit; silicles ovate-
 oblong, nearly quadrangular, slightly dilated at the base, 2 mm long;
 wings ovate, acutish; style half as long as the pod. — Flow. May.

N. d. Tell-el-Kebîr.

Also known from Arabia and Palestine.

575. (3.) **Lepidium Draba** L. Spec. Plant. I (1753), p. 645. —
 Boiss. Fl. Or. I, p. 356. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 40

no. 65. — Thellung Monogr. Gattg. *Lepidium*, p. 86. — *Cochlearia Draba* L. Syst. ed. 10 vol. II, p. 1129. — Delile III. Flor. d'Eg., no. 579. — *Nasturtium Draba* Crantz Crucif., p. 91. — *Cardaria Draba* Desv. Journ. Bot. III, p. 163. — *Lepidium drabifolium* St. Lag. in Ann. Soc. Bot. Lyon VII, p. 129. — Perennial, 30—50 cm high or more pubescent; stem erect, corymbose at the apex. Leaves oblong to oblong-lanceolate, repand or dentate, those of root petiolate, of stem sagittate-clasping, Silicles cordate at the base, often with one rudimentary cell; valves turgid. — Flow. January to March.

M. ma. Mariut; Alexandria-West and -East, not abundant, on way sides. — **N. d.** Heliopolis near Cairo.

Also known from all the other parts of the Mediterranean region (except Morocco), Europe, Caucasia, Mesopotamia, Persia and India.

576. (4.) ***Lepidium latifolium*** L. Spec. Plant. I (1753), p. 644. — Thellung Monogr. *Lepidium*, p. 158. — Boiss. Flor. Or. I, p. 359. — Aschers.-Schweinf. III. Flor. d'Eg., p. 40 no. 66. — Sickenberg. Contrib. Flor. d'Eg., p. 176. — DC. System. II, p. 548. — *Cardaria latifolia* Jaub. and Spach Hist. vég. Phan. VI, p. 546. — *Nasturtium latifolium* Gillet and Magne Nouv. Fl. Franç. ed. III, p. 48. — *Lepidium heliopolitanum* Ehrenberg ined. in Herb. Berol. — Perennial 10 cm high or more, glabrous or puberulent, paniculate above. Leaves oblong-lanceolate, entire or dentate, the lower ones long-petioled, 15 cm long, the upper ones short-petioled or merely tapering at the sessile base. Silicles ovate-orbicular or elliptical, 1—15 mm long, sometimes retuse at the base, glabrous or puberulent; stigma sessile. — Flow. March to April.

M. ma. Abusir, in deep sand; Mariut; Alexandria-West and -East; Mandara; Abukir. — **N. d.** Cairo, cultivated in old Arabian gardens and often naturalized; Matariya, on waysides, abundantly.

Also known from Europe, Asia and all the other parts of North Africa.

239. (29.) ***Biscutella* L.**

Sepals equal or saccate at the base. Petals obovate, entire, clawed. Stamens free, toothless. Silicles indehiscent, twin, much flattened; valves orbicular, separable from axis, 1-seeded. — Annual or perennial herbs, often hirsute, with yellow flowers.

A small genus widely distributed in the Mediterranean region and in Asia.

577. ***Biscutella didyma*** L. Spec. Plant. ed. I (1753), p. 911. — var. ***Apula*** Cosson (Comp. Flor. Atl. II (1883), p. 287. — *Biscutella Apula* L. Mant., p. 254. — *Biscutella Columnae* Tenore Prodr. Flor. Nap., p. 38. — Boiss. Flor. Or. I, p. 321. — Aschers. in Rohlfs

Kufra, pag. 509. — *Biscutella apula* var. *depressa* Aschers. and Schweinf. Ill. Fl. d'Eg., p. 39 no. 61. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 593 no. 15. — *Biscutella ciliata* DC. Monogr. *Biscutella* in Ann. Mus. Paris XVIII, p. 297 no. 9. — *Biscutella didyma* Halasc. Consp. Flor. graec. I, p. 104. — An annual, erect herb, 20—40 cm high. Leaves obovate-cuneate, to oblong-lanceolate and linear, dentate or entire. Stem nearly naked. — Flow. January to April.

M. ma. Marmarica: Matruqa; Alexandria-West and -East.

Also known from the other parts of the Mediterranean region and Persia.

240. (30.) *Coronopus* Hall.

Sepals short, spreading. Siliqua minute, 2-lobed, more or less laterally compressed; valves rough or crested, roundish, separating when ripe as two closed, indehiscent, 1-seeded cocci. Embryo curved, with narrow cotyledons or radicle incumbent. — Low diffuse herbs. Leaves pinnatifid or entire. Racemes usually short, leaf-opposed or apparently axillary.

A small, widely dispersed, weed-like genus.

A. Silicules quite entire at the apex 1. *C. squamatus*.

B. Silicules deeply emarginate at the apex 2. *C. niloticus*.

578. (1.) *Coronopus squamatus* (Forsk.) Ascherson in Flor. Provinz Brandbg. (1860), p. 62. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 40 no. 67. — *Lepidium squamatum* Forsk. Flor. aeg.-arab., p. 117. — *Coronopus verrucarius* Muschler and Thellung in Mttlg. Bot. Mus. Zuerich XXVIII (1906), p. 318. — Muschler Monogr. *Coronopus* in Engler's Bot. Jahrb. XLI, p. 128. — *Nasturtium verrucarium* Gars. Deser. Plant., tab. 402. — *Cochlearia Coronopus* L. Spec. Plant. I, p. 904. — *Coronopus procumbens* Gilib. Flor. Lit. II, p. 52. — *Coronopus Ruellii* All. Flor. Pedem. I, p. 256. — *Senebiera Coronopus* Poir. Dict. VII. p. 76. — A pale green, glabrous or glaucous annual, the stems, when first flowering, forming a short, close tuft, afterwards spreading along the ground to the length of 16 cm or more. Leaves once or twice pinnately divided, the segments not numerous, linear, or wedge-shaped, entire or toothed. Racemes at first forming close sessile heads, but, as the fruit ripens, lengthening out to 2 or 4 cm. Pedicels seldom 2.5 mm long. Pod about 5 mm broad and not quite so long, scarcely notched at the top, marked with deep wrinkles, which form a kind of crest round the edge; it usually remains entire when ripe. — Flow. March to May.

M. ma. N. d. N. f. N. v. O. Everywhere abundantly in cultivated and waste places.

Local name: riglet-el-ghorab (Muschler).

Also known all the other parts of the Mediterranean region and Europe.

579. (2.) **Coronopus niloticus** (Delile) Spreng. Syst. Veg. III (1825), p. 583. — Muschler Monogr. *Coronopus* in Engler's Bot. Jahrb. XLI, p. 142. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 40 no. 68. — *Cochlearia nilotica* Delile Ill. Flor. d'Eg., p. 19 tab. 34 fig. 2. — *Cotyliscus niloticus* Desv. Journ. Bot. III, p. 164 tab. 25 fig. 13. — *Senebiera nilotica* DC. Syst. II, p. 527. — Boiss. Flor. Or. I, p. 363. — Vis. Plant. quaed. aeg., p. 26 no. 26. — *Thlaspi Cardaminis* var. *aegyptiaca* Poir. Dict. VII, p. 545. — An erect, diffuse or sometimes decumbent, branching, glabrous or nearly glabrous herb. Radical leaves linear-lanceolate or oblanceolate, pinnatisect, toothed or nearly entire; cauline ones entire, linear or oblong or pinnately toothed. Racemes lateral and terminal, often very short, of numerous very small white flowers. Silicles more or less cordate-reniform; apex nearly or quite emarginate, more or less wrinkled, on slender short pedicels. — Flow. January to March.

N. d. N. f. N. v. Common on alluvial ground. — **O.** Dakhel. — **D. a. mer.** Qoseyr.

Local name: reshâd (Delile); generally: harra.

241. (31.) **Isatis** Linn.

Erect annuals or biennials, with undivided leaves, the upper ones clasping the stem, and auricled. The flowers small, yellow, and numerous. Pod flat, pendulous, obovate or oblong, with a strong rib on each side, indehiscent and containing a single seed. Radicle incumbent.

A genus, spread over southern Europe and western Asia. — The Woad, *Isatis tinctoria*, has been cultivated in bygone centuries in Europe for a blue dye, already by the old Britons. Queen Elizabeth forbade its cultivation, because she did not like the smell.

580. **Isatis microcarpa** I. Gay in Schimp. Plant. Arab. exsicc. — Boiss. in Ann. Scienc. Natur. (1842), p. 201. — Flor. Or. I, p. 382. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 40 no. 74. — Aschers. Flor. Rhinocol., p. 790 no. 27. — Siekenberg. Contrib. Flor. d'Eg., p. 176. — An annual, erect plant, 30—40 cm high or more, glabrous, glaucous. Root-leaves oblong, nearly entire, 3—5 cm long; stem-leaves lanceolate or triangular, auricled, entire. Silicles, elliptical, 6 mm long, 3 mm broad, rounded at the base, obtuse or acutish at the apex; cell separated from the wing by an almost obsolete groove. — Flow. March to April.

D. i. Wady-el-'Arish; Gebel Eklên in sandy places. — **D. a. sept.** Galâla.

Local name: sofeyrâ.

Also known from Arabia and Syria.

var. **blepharocarpa** Ascherson in Aschers. and Schweinf. Suppl. Ill. Flor. d'Eg. (1889), p. 747. — Aschers. in Flor. Rhinocol., p. 790 no. 27. — Fruits ciliate. — Flow. March.

M. p. El-Arish, more frequent than the type.

Only known from the type.

242. (32.) **Neslea** Desv.

Calyx equal at the base. Petals entire. Filaments toothless. Silicles compressed, obovate-spheroidal, indehiscent, 2-ovuled, 1-seeded; stigma retuse, seed pendulous. — Annual herbs, hirsute with branching hairs; stem-leaves sagittate; flowers small, yellow.

A small genus in the Mediterranean region and Europe.

581. **Neslea paniculata** Desv. Journ. Bot. III (1813), p. 162. — Boiss. Flor. Or. I, p. 371. — Rehb. Ic. II, fig. 4291. — Aschers. Flor. Rhinocol., p. 790 no. 27. — *Myagrum paniculatum* L. Spec. Plant. I, p. 894. — An erect annual herb, 30—60 cm high or more; leaves oblong to lanceolate, entire or dentate. Fruiting racemes 3—18 cm long, pedicels spreading, filiform, thrice as long as the reticulated silicles; style apiculate. — Flow. March.

M. p. El-Arish.

Also known from all the other parts of the Mediterranean region and Europe.

243. (33.) **Calepina** Adans.

Calyx spreading, equal at the base. Petals obovate. Filaments free, toothless. Silicles ovate spherical, indehiscent, beaked with a short, angular style, obsoletely 4-ribbed, reticulated, 1-celled; seeds pendulous. — Annual herbs, with white flowers.

A small genus in Southern Europe and the Mediterranean region.

582. **Calepina Corvini** (All.) Boiss. Flor. Or. I (1867), p. 409. — Rehb. Ic. II, fig. 4163. — *Crambe Corvini* All. Flor. Pedem., no. 937. — An annual erect herb, 30—60 cm high or more, glabrous. Root-leaves rosetted, lyrate; stem-leaves oblong, auricled, dentate. Pedicels spreading, filiform, twice or thrice as long as the pods. — Flow. March.

M. ma. Mandara recently introduced.

Also known from Syria and Palestine.

244. (34.) **Schimpera** Hochst. and Steud.

Calyx spreading, equal at the base. Petals equal, entire. Filaments free, toothless. Silicles indehiscent; cell ovate, crustaceous.

tubercled, ending in a linear, compressed beak. Seed 1, pendulous.
— Desert annuals, with minute yellow flowers.

A small genus in the Orient and Arabia.

583. **Schimpera arabica** Hochst. and Steud. in Schimp. Plant. Arab. exsicc. — Boiss. Flor. Or. I, p. 384. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 40 no. 75. — Sickenberg. Contrib. Flor. d'Eg., p. 176. — An annual erect herb, 10—25 cm high, sparingly papillose-puberulent. Root-leaves rosetted oblong, runcinate-dentate or pinnatifid; stem-leaves linear, entire, auricled. Cell of the silicle ovate: beak oblique, thrice its length. — Flow. March to April.

M. p. El-'Arîsh. — **D. i.** Sandy places under Gebel Ekhfên (Deffers.). — **D. a. sept.** Wady-'Arabah.

Also known from Arabia Petraea.

var. **lasiocarpa** Boiss. Flor. Or. I (1867), p. 384. — Sickenberg. Contrib. Flor. d'Eg., p. 176. — Pods densely papillous-lanate. — Flow. March.

D. i. Between Nukhl and Gazza in deserts.

Also known from Arabia Petraea.

245. (35.) **Zilla** Forsk.

Sepals erect. Petals clawed. Silicle bony or crustaceous, ovoid or pyramidal, beaked, winged or unappendaged. Seeds solitary. Cotyledons conduplicate. — Biennial, much-branched, often spinescent herbs. Leaves oblong or linear, entire or toothed, rather fleshy. Flowers white or violet, solitary or racemose.

A small desert genus of northern Africa and western Asia.

584. **Zilla spinosa** (Forsk.) Prantl in Engler Natuerl. Pflanzfam. III, 2 (1894), p. 174. — *Zilla myagroides* Forsk. Flor. aeg.-arab., p. 121. — Icon. tab. 17 A. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 42 no. 100. — DC. Syst. II, p. 646. — Sickenberg. Contrib. Flor. d'Eg., p. 180 (var. *macrocarpa* and *microcarpa*!). — *Bunias spinosa* L. Mant., p. 96. — Biennial. Glauous more or less. Branches rigid, terete, intricate, usually terminating in acute divaricate spines. Flowers scattered on the extremities or subracemose. Silicle shortly pedicellate, ovoid or ovoid-globose with a conical-subulate beak, nearly smooth or reticulate-rugose.

M. ma. Marmarica; Matruqa; Abusîr; Alexandria-West and -East; Mandara; Abukîr. — **D. l.** **D. i.** **D. a. sept.** **D. a. mer.** Everywhere a characteristic plant of the Wadies.

Local name: ummo (Delile); besille (Klunzinger); shegeret-el-hummus (Roth); generally: sille; sirr; sirrâye (Ascherson).

Also known from Orient and Asia Minor.

246. (36.) **Rapistrum** Tourn.

Calyx spreading, somewhat bigibbous at the base. Petals clawed, entire. Filaments toothless. Loment indehiscent; joints 1-celled; the lower one oblong or pedicelliform, marked with sutures of indehiscent valves, seedless or with 1—2 pendulous seeds; the upper one ovoid-globular, beaked, with 1 erect seed. — Tall, yellow-flowered herbs.

A small genus in Middle Europe and the Mediterranean region.

585. **Rapistrum rugosum** All. Flor. Pedem. I (1785), p. 275 tab. 78. — Boiss. Flor. Or. I, p. 404. — Rehb. Ic. II, fig. 4168. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 42 no. 98. — An annual erect herb, 30—60 cm high or more. Lower leaves lyrate; upper ones oblong, repand. Fruiting pedicels stiff, thickened, as long as and narrower than the obconical lower joint of the loment; upper joint marked with longitudinal crests; style as long as the pod. — Flow. March to April.

M. ma. Ramle.

Also known from the other parts of the Mediterranean region and Middle Europe.

var. **orientale** Coss. Compend. II (1883—1887), p. 314. — *Rapistrum orientale* DC. Syst. II, p. 433. — Boiss. Flor. Or. I, p. 404. — *Myagrum orientale* L. Spec. Plant. I, p. 893. — Pods glabrous. — Flow. March to April.

M. p. Qatiya.

Also known from Tunisia, Algeria, Tripolitania and Southern Europe.

247. (37.) **Didesmus** Desv.

Calyx erect, somewhat bigibbous at the base. Petals obovate, clawed. Filaments free, toothless. Loments oblong, leathery, with indehiscent, 1-seeded, generally angled and grooved joints, the terminal one pyramidal; seeds globular, pendulous. — Annual, white-flowered herbs, with aspect of *Myagrum* and *Erucaria*.

A small genus in Southern Europe and the Mediterranean region.

586. **Didesmus aegyptius** Desv. Journ. Bot. III (1813), p. 160 tab. 25 fig. 11. — Boiss. Flor. Or. I, p. 404. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 42 no. 99. — Sickenberg. Contrib. Flor. d'Eg., p. 176. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 594 no. 25. —

Myagrum aegyptium L. Spec. Plant. I, p. 895. — Annual. Sparingly scabrous. Leaves oblong obtuse, remotely dentate, or the lowermost lyrate. Joints of the loment of equal length, ovate 4-angled, the terminal longer than the style. — Flow. March to April.

M. ma. Marmarica. — **D. a. sept.** Near Thebes, (?) on hills (Webb Fragm., p. 21).

Also known from Creta, Greece and all the other part of the Mediterranean region.

248. (38.) *Cakile* Tourn.

Calyx bigibbous at the base. Petals obovate, clawed. Filaments free, toothless. Loments with 2 joints; the lower one shorter, top-shaped, truncate at the apex; the upper ensiform; both 1-celled, 1-seeded; stigma sessile. — Annual, fleshy, glabrous, maritime herbs, with dentate, pinnate, or rarely entire leaves, and pale or pink flowers.

A small genus widely distributed in Europe and the Mediterranean region.

587. *Cakile maritima* Scop. Flor. Carniol. ed. 2 Vol. II (1771). p. 35. — Boiss. Flor. Or. I, p. 365. — DC. Syst. II, p. 428. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 40 no. 69. — Sickenberg. Contrib. Flor. d'Eg., p. 176. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 593 no. 17. — *Bunias Cakile* L. Spec. Plant., p. 936. — An annual erect plant, 25—30 cm high or more. Leaves pinnatifid, with linear, obtuse lobes. Lower joint usually 2-toothed at the top. — Flow. December to February and March.

M. ma. Marmarica; Alexandria-West and -East. — **M. p.** Rosetta; Damietta; Islands of Lake Menzaleh.

Local name: reshād-el-bahr (Delile); figl-el-gemāl.

Also known from Europe and all the other parts of the Mediterranean region.

var. ***aegyptiaca*** Coss. Comp. Flor. Atlant. II (1883—1887). p. 305. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 40 no. 69. — Sickenberg. Contrib. Flor. d'Eg., p. 176. — *Cakile maritima* var. *sinuatifolia* DC. System. II, p. 429. — *Cakile maritima* Scop. var. *β integrifolia* Boiss. Fl. Or. I, p. 365. — *Isatis aegyptiaca* L. Spec. Plant. I, p. 937. — Forsk. Flor. aeg.-arab., p. 121. — *Isatis pinnata* Forsk. Flor. aeg.-arab., p. 121. — *Cakile aegyptiaca* Gaertner Fruct. II, tab. 141. — Leaves oblong, entire or sinuate dentate. — Flow. March.

M. ma. Marmarica; Montaza; Alexandria-West and -East; Abukîr. — **M. p.** Brullus

Local name: fugeyla; harra (Ascherson); gerâgîre (Ascherson).

Also known from all the other part of the Mediterranean region.

249. (39.) **Enarthrocarpus** Labill.

Sepals erect, equal at the base or the two lateral saccate. Siliquas elongate, curved, somewhat compressed, separated by an articulation into two indehiscent articles; the lower article shorter, with connate valves, 1—4-seeded, seeds pendulous; upper article 3—6-seeded, seeds erect. Radicle incumbent and the cotyledons in the seeds of the lower article conduplicate or folded. — Erect, scabrid or more or less hispid annual herbs. Leaves, radical lyrate, cauline toothed. Racemes elongate, more or less bracteate. Flowers yellowish or purple.

A small genus of the eastern Mediterranean region.

A. Pods not winged, distinctly longitudinally striate 1. **E. lyratus**.

B. Pods winged below, transversely taved.

I. Pods erect 2. **E. pterocarpus**.

II. Pods torulose 3. **E. strangulatus**.

588. (1.) **Enarthrocarpus lyratus** (Forsk.) DC. Syst. II (1821), p. 666. — Boiss. Flor. Or. I, p. 399. — DC. Ill. Flor. d'Eg., p. 36 fig. 1. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 42 no. 93. — Sickenberg. Contrib. Flor. d'Eg., p. 180. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 594 no. 23. — *Raphanus lyratus* Forsk. Flor. aeg.-arab., p. 119. — *Raphanus recurvatus* Pers. Ench. II, p. 209. — Jaub. and Spach Ill. Plant. Orient, tab. 36 fig. 1. — An erect or ascending, more or less branched herb, more or less pilose-hirsute below. Basilar leaves lyrate-pinnatifid, lobes spreading, toothed; cauline ones lyrate- or pinnately-toothed, more or less hirsute or sparsely pilose. Racemes terminal, elongate, bracteate. Bracts oblong or oblanceolate, toothed or the lower lyrate. Pedicels erect, 1—2 lines. Flowers "yellowish, streaked with purple". Siliquas erect or curved, more or less nodulose, longitudinally striate, glabrate scabrid or pilose, obtusely acuminate with the persistent style. — Flow. January to March.

M. p. El-Arish. — N. d. N. f. N. v. O. D. a. sept. D. a. mer. On alluvial soil and often in deep sand.

Local name: shirtêm (Schweinfurth); reshâd-el-barr (Delile); shirtâm; shiltâm; sholtâm.

Also known from Dongola.

589. (2.) **Enarthrocarpus pterocarpus** DC. Syst. II, (1821), p. 661. — Boiss. Flor. Or. I, p. 399. — Deless. Ic. II, tab. 93. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 42 no. 94. — Sickenberg. Contrib. Flor. d'Eg., p. 180. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 594 no. 24. — Much branched from the base, hispid-scabrid below.

Muschler, Manual Flora of Egypt.

Leaves petiolate, lyrate-pinnatifid with dentate segments; upper oblong, dentate or serrate. Pedicels erect, usually bracteate. Siliques erect, linear-acuminate arcuate, with winged setulose-scabrid margins; valves transversely constricted. — Flow. January to March.

M. ma. Marmarica: Matruqa; Alexandria-West and -East. — **M. p.** Wady-el-'Arîsh.

Local name: ssultâm; shirtâm (Ascherson).

Also known from Marmarica, Tripolitania and Nubia.

590. (3.) **Enarthrocarpus strangulatus** Boiss. Diagn. Plant. Or. ser. 1, VIII (1849), p. 44. — Flor. Or. I, p. 399. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 42 no. 94. — Sickenberg. Contrib. Flor. d'Eg., p. 180. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 594 no. 24. — An annual, erect plant, 30—100 cm high, sparingly papillose hairy or most, more or less hispid, especially below. Pedicels nearly all bracted. Loments 3—4 cm long, appressed scabrous, especially at the margins, flattened, keeled, curved, torulose, striate; beak long, often hooked; lower joint 1—2-seeded. — Flow. February to April.

M. ma. Marmarica: Matruqa; Mariut; Montaza; Alexandria-West and -East; Mandara. — **M. p.** Wady-el-'Arîsh. — **N. d.** Cairo.

Local name: sholtâm; ssultâm; shirtâm (Ascherson).

Also known from Tripolitania and Arabia Petraea.

var. **amalecitanus** Aschers. in Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. (1889), p. 747. — Pods twice as long as in the type, canescent. — Flow. March.

M. p. El-'Arîsh.

Only known from this locality.

250. (40.) **Reboudia** Coss. and Dur.

Calyx erect, saccate at the base. Petals obovate, clawed. Filaments toothless. Loments 2-jointed, slender; lower joint terete, dehiscent, longer than the upper one, 2-celled, 2-valved; seeds 2—6 in each cell, pendulous; upper joint indehiscent, ovate or ensiform, beaked, cells 1—3, 1-seeded. — Annual, branching herbs, with pinnatisect leaves, and lilac flowers.

A small genus widely spread in Northern Africa.

591. **Reboudia microcarpa** (Boiss.) Coss. Compend. Flor. Atlant. II (1883—1887), p. 213. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 40 no. 70. — Sickenberg. Contrib. Flor. d'Eg., p. 176. — *Erucaria microcarpa* Boiss. Diagnos. Plant. Orient. ser. I fasc. VIII, p. 47. — Flor. Or. I, p. 366. — Jaub. and Spach Ill. Plant. Or.,

tab. 434. — *Raphanus pinnatus* Viv. Flor. Libyc., p. 37 tab. 16 fig. 4. — An annual, erect plant, 10—30 cm high, papillose-scabrous. Lobes of the lower leaves at right angles to axis, fleshy, short, pinnatifid; of upper linear, entire. Loments 6 mm long, ascending, glabrous or scabrous; lower joint torulose, flattened, many-seeded; upper ovate, half as long as the lower, shorter than the style. — Flow. February to April.

M. ma. Montaza; Alexandria; Mariut; Abukîr. — **D. a. sept.** Moqattam; Galâla.

Local name: selikh (Schweinfurth); lislis (Ascherson).

Also known from Tripolitania, Arabia Petraea and Palestine.

251. (41.) *Erucaria* Gaertn.

Calyx erect, equal at the base. Petals obovate, clawed. Filaments toothless. Loments 2-jointed, slender; lower joint terete, dehiscent, longer than the upper one, 2-celled, 2-valved; seeds 2 to 6 in each cell, pendulous; upper joint indehiscent, ovate or ensiform, beaked, cells 1—3, 1-seeded. — Annual, branching herbs, with pinnatisect leaves, and lilac flowers.

A small genus in the Orient.

A. Lower joint as long as the upper one 1. **E. aleppica**.

B. Lower joint half as long as the upper one . . . 2. **E. crassifolia**.

C. Lower joint 4—5-times shorter than the upper one 3. **E. uncata**.

592. (1.) ***Erucaria aleppica*** Gaertn. Fruct. II (1791), p. 298 tab. 143 fig. 9. — var. ***latifolia*** (DC.) Boiss. Flor. Or. I (1867), p. 366. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 40 no. 71. — Supplem., p. 746 no. 71. — Sickenberg. Contrib. Flor. d'Eg., p. 176. — *Erucaria latifolia* DC. Syst. II, p. 675. — Deless. Ic. II, tab. 95. — An annual erect herb, 30—60 cm high, or more, nearly glabrous. Lobes of lower leaves linear or oblong, pinnatifid, those of the upper ones narrow, elongated, entire. Loments stiff, 1.5 cm long, generally appressed; lower joint cylindrical, many-seeded, upper ensiform, somewhat keeled, 1-seeded, nearly as long as lower, and as long as awl-shaped style. — Flow. March to April.

M. ma. Ramle; Mandara. — **M. p.** El-Arîsh. — **N. d.** Turra.

593. (2.) ***Erucaria crassifolia*** (Forsk.) Del. Illustr. Flor. d'Eg., (1813), p. 20 tab. 34 fig. 1. — Boiss. Flor. Or. I, p. 366. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 40 no. 72. — Sickenberg. Contrib. Flor. d'Eg., p. 176. — *Brassica crassifolia* Forsk. Flor. aeg-arab., p. 118. — An annual erect herb, 30—40 cm high, glabrous. Lobes of leaves oblong-linear to linear, entire, or sparingly dentate. Young loments

deflexed, at maturity nearly horizontal, 1,6 cm long, lower joint half as long as the upper one, cylindrical, many-seeded, upper ensiform, somewhat keeled, thicker than the lower one; beak short, awl-shaped. — Flow. March to April.

D. l. Pyramids of Gîza and Saqqâra. — **D. a. sept.** Turra.

Local name: krumb-es-sahra (Forskål).

Also known from Arabia Petraea.

594. (3.) **Erucaria uncata** Boiss. Diagn. Plant. Orient. ser. 1 fasc. VIII (1849), p. 47. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 40 no. 73. — *Hussonia uncata* Boiss. Flor. Or. I, p. 367. — *Erucaria Tourneuxii* Coss. Comp. Flor. Atlant. II, p. 48. — *Erucaria aegiceras* Gay in Steud. Nom., p. 311. — An annual erect herb, 20—30 cm high, or more, scabrous below, glabrous above, flexuous, twining among shrubs. Leaves pinnatisect, lobes linear to oblong, entire or dentate to pinnatifid. Loments short pedicelled, 3—4 cm long, curved or contorted; beak hooked. — Flow. March to April.

M. ma. M. p. D. i. D. a. sept. Everywhere in deep sand.

Local name: slih (Ascherson).

Also known from Arabia Petraea.

252. (42.) **Raphanus** Linn.

Coarse, often hairy annuals or biennials; the lower leaves pinnatifid or pinnate, the flowers rather large. Pod more or less elongated, thick, pointed, indehiscent, more or less contracted or even jointed between the seeds, without any longitudinal partition when ripe, but containing several seeds, separated by a pithy substance filling the pod. Radicle incumbent on the back of the cotyledons, which are folded over it.

A genus well characterised by the pod, but consisting of very few species, or perhaps of more or less permanent races of one species. The garden Radish is unknown in a wild state, but some Mediterranean varieties of the wild one come so near to it as to suggest its being a cultivated race of that species, although placed by some botanists in a distinct genus.

A. Upper joint of the loment continuous, with

2 longitudinal cells 1. **R. sativus**.

B. Upper joint of the loment 1-celled, but con-

stricted between the seeds 2. **R. Raphanistrum**.

595. (1.) **Raphanus sativus** L. Spec. Plant. I (1753), p. 935. — Boiss. Flor. Or. I, p. 401. — Coss. Comp. II, p. 220. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 42 no. 97. — Sickenberg. Contrib. Flor. d'Eg., p. 180. — An annual erect plant, 50 cm to 2 m high,

sparingly papillose-hairy or glabrescent. Upper joint of the loment 3—5 cm long, 1 cm thick, oblong-conical, inflated, glabrous, longer than beak. — Flow. January to March.

N. d. Escaped from cultivation; everywhere.

Local name: figl.

Cultivated in most parts of the globe.

596. (2.) **Raphanus Raphanistrum** L. Spec. Plant. I (1753), p. 935. — Boiss. Fl. Or. I, p. 401. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 47 no. 97. — Sickenberg. Contrib. Flor. d'Eg., p. 176. — Raphanistrum segetum Rehbch. Ic. II, fig. 4172. — An annual erect plant, 30 cm to 1 m high or more, sparingly scabrous. Upper joint of the loment glabrous, 5—8 cm long, 4 mm thick, necklace form, with two to eight nodes, ribbed; beak 3—5 times as long as the upper node. — Flow. December to March.

M. ma. Ramle; Abukîr. — **N. d.** Gize.

Local name: eysh u gibne.

Also known from all the other part of the Mediterranean region and Europe.

41. Resedaceae.

Flowers usually hermaphrodite, irregular or nearly regular. Calyx 4—7-partite; segments unequal or nearly equal. Petals 2—4—7 or 0; lamina entire or 3—7-partite, simple or with a dilated claw, free or rarely shortly connate at the base, open in aestivation. Disk sessile or shortly stipitate, often unilateral or 0. Stamens 3—40, inserted on the disk or hypogynous, often declinate, free or the filaments united at the base; anthers 2-celled. Ovary sessile or stipitate, of 2—6 connate carpels, at least closed or more frequently open at the apex narrowed into short, cuspidate styles. Ovules indefinite, sometimes few, inserted upon parietal placentas, or around the centre and base of the ovary. Fruit an open capsule, or indehiscent, baccate in one genus, or of as many minute follicles as carpels. Seeds indefinite, sometimes few, more or less reniform, exalbuminous; embryo curved or folded with an incumbent radicle. — Annual or perennial herbs or shrubby. Leaves scattered or fasciculate, entire, 3-fid or pinnatifid; stipules minute. Flowers racemose or spicate, bracteate.

A small Natural Order, principally confined to the Mediterranean region and Asia Minor.

Petals 5, of which 2 at least are 5—7-partite; carpels 6,

open, connate at the base, shortly stipitate. . . 1. *Caylusea*.

Petals 4—7, of which at least 2 are 3—10-partite.

Ovary 3- or 4-lobed at the apex. Fruit an open

capsule 2. *Reseda*.

Petals 2, undivided. Capsule with 4 teeth or cusps 3. *Oligomeris*.

Petals 0. Fruit a closed berry 4. *Ochradenus*.

253. (1.) *Caylusea* St. Hil.

Calyx 5-partite. Petals 5, of which usually 2 (or 3) have a 5—7-partite lamina; claw obcordate. Stamens 10—14, inserted upon a slightly raised torus. Carpels 6, in a single whorl upon a short gynophore, connate at the base, open above; ovules indefinite, collected in the centre of the carpels. Ripe carpels radiating widely, few-seeded. — Glabrous, setulose-pilose or pilose herbs. Leaves usually entire, lanceolate or linear. Flowers small, in terminal, bracteate racemes.

A small genus of only two species, widely distributed in Tropical Africa.

597. *Caylusea canescens* St. Hil. Mém. Résédac. (1838), p. 30. — Boiss. Flor. Or. I, p. 436. — Müll. Arg. Monogr. Resed., p. 226 tab. X fig. 132. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 44 no. 122. — Bent. Hook. Gen. Plant. I, p. 111. — Sickenberg. Contrib. Flor. d'Eg., p. 182. — *Reseda canescens* L. Syst., p. 368. — *Reseda hexagyna* Forsk. Flor. aeg.-arab., p. 92. — A diffuse or ascending herb, sometimes, in dry situations, with rather rigid, divaricate branches, more or less sparsely hirsute-pilose or very shortly setulose-pilose. Leaves linear-lanceolate or lanceolate, obtuse or acute, usually with a wavy margin, thinly setulose, at least upon the midrib beneath. — For synonymy, see Webb, *Spicilegia Gorgonea*, 101. — Flow. October to March.

M. ma. Abusir; Alexandria-East and -West. — **M. p.** Rosetta; Damietta; El-'Arish. — **N. f.** Medînet-el-Fayûm; Tamîa; Senhûr; Senuris; Abuksa. — **O.** Dakhel. — **D. l. D. i. D. a. sept. D. a. mer.** Everywhere abundantly on calcareous ground.

Local name: denâba (Delile); gittiât; muddeyd (Ascherson).

Extends from the Cape de Verd islands eastward through Northern Africa and Arabia to N. W. India.

254. (2.) *Reseda* Linn.

Erect or decumbent herbs with entire, lobed or pinnatifid leaves and small spicate or narrowly racemose flowers. Petals 4—7, toothed or cleft. Disk cup-shaped, glandular. Stamens 8—30, inserted on

the inner surface of the disk and on one side of the flower. Capsule 3—6-lobed, horned at the top before maturity.

A considerable genus, most numerous in countries bordering the Mediterranean and in Western Asia. Most of the following Egyptian species are widely distributed in the Orient.

A. Flowers 5—6-merous. Pods erect, 4-toothed. Leaves 1—2-pinnatisect.

I. 60 to 100 cm high; petals twice as long as the calyx 1. *R. alba*.

II. 10 to 30 cm high; petals a little longer than the calyx 2. *R. decursiva*.

B. Flowers 6—8-merous. Pods 3-toothed. Leaves entire or 1—2-ternate-cut, sometimes pinnate.

I. Sepals persistent.

a) Pods at length pendulous. Seeds pitted, wrinkled.

1. Ovary not stipitate. Filaments persistent 3. *R. arabica*.

2. Ovary stipitate. Filaments soon deciduous 4. *R. odorata*.

b) Pods erect seeds smooth. Calyx not accrescent.

1. Papillous-asperulous; petals lutea . . . 5. *R. lutea*.

2. Glabrous; petals alba 6. *R. Boissieri*.

II. Sepals deciduous. Pods erect, medium. Seeds small.

a) Lobes of the upper petals 7—9, similar; Filaments persistent; seeds pitted 7. *R. muricata*.

b) Lateral lobes of the upper petals minute, central one obovate; Filaments deciduous; seeds smooth.

1. Flowers short pedicelled; capsules papillose, cylindrical-club-shaped 8. *R. pruinosa*.

2. Flowers sessile or nearly so; capsule stiff; obovate-truncate 9. *R. luteola*.

598. (1.) **Reseda alba** L. Spec. Plant. I (1753), p. 645. — Boiss. Flor. Or. I, p. 425. — Rchbch. Ic. II, fig. 4448. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 44 no. 113. — Sickenberg. Contrib. Flor. d'Eg., p. 182. — A tall perennial, the lower leaves crowded on the stock or base of the stem, and all deeply pinnate, with numerous (9—21) linear or lanceolate segments, entire, but waved on the margins. Flowers on short pedicels, fragrant much whiter than in the following two species. Sepals 5 or 6. Petals as many, all equal, and 3-cleft. Capsule ovoid, with 4, or sometimes 3, 5, or 6 teeth. — Flow. February to March.

M. ma. Alexandria-West and -East; Montaza. — **N. v.** Often spontaneous, in sandy places.

Local name: khirfeysh.

Also known from the other parts of the Mediterranean region and Persia and India.

599. (2.) **Reseda decursiva** Forsk. Flor. aeg.-arab. (1775), p. 89. — Sickenberg. Contrib. Flor. d'Eg., p. 182. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 44 no. 114. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 594 no. 27. — *Reseda eremophila* Boiss. Flor. Or. I, p. 425. — Aschers. Flor. Rhinoc., p. 791 no. 35. — *Reseda propinqua* Boiss. Diagn. Plant. Orient. ser. I fas. VIII, p. 88 not R. Br. — Ic. Müll. Resed. tab. 6 fig. 90. — An annual erect plant, 10—30 cm high, nearly glabrous, branching at the base. Leaves mostly near the base. Flowers minute, spiked; petals a little longer than the sepals; pod almost sessile, obovate to oblong, 5 m long. — Flow. February to March.

M. ma. Marmarica: Matruqa; Alexandria; Mandara. — **M. p.** Qatiya to el-'Arish. — **D. i.** Es-Sâlihîya; Ismailia. — **D. a. sept.** Gebel ahmar; Qubba; Moqattam; Birket-el-hagg; Khanka; Petrified Forest; Reseda-valley near Wady Hof.

Local name: khirfeyeh; rigl-el-ghorab (Ascherson).

Also known from the other parts of the Orient.

600. (3.) **Reseda arabica** Boiss. Diagn. Ser. Plant. Orient. Ser. I fasc. I (1846), p. 6. — Flor. Or. I, p. 426. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 44 no. 115. — Aschers.-Schweinf. Primit. Flor. Marm., p. 594 no. 28. — Sickenberg. Contrib. Flor. d'Eg., p. 182. — Müll. Arg. Monogr. Resed., p. 124 tab. 6 fig. 93. — Coss. Ill. Flor. Atl. I, p. 105 tab. 67. — An annual herb, 10—25 cm high, sparingly pruinose. Lowest leaves simple, oblong-linear, upper one ternate, with linear to lanceolate lobes, sometimes wavy. Pedicels longer and petals shorter than the calyx; pods nearly globular. — Flow. March to May.

M. ma. D. l. D. i. D. a. sept. Everywhere in deep sand.

Also known from Morocco, Algeria, Tunisia, Tripolitania, Marmarica, Arabia and Persia.

601. (4.) **Reseda odorata** L. Spec. Plant. I (1753), p. 646. — Boiss. Flor. Or. I, p. 428. — Müll. Arg. Monogr. Resed., p. 128 tab. 6 fig. 95. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 44 no. 115 a. — Rehb. Ic. II, fig. 4444. — Sickenberg. Contrib. Flor. d'Eg., p. 182. — An annual, glabrous herb, branched from the base. Leaves entire, spatulate, the upper ones often ternately incise. Racemes floriferous

short, ovoid; pedicels twice as long as the calyx; sepals linear-spathulate as long as the corolla; filaments linear-subulate, scabridulous; capsules obovate-globose torulous. — Flow. March to April.

N. d. Alexandria-West, naturalized and everywhere cultivated.

Local name: tamr-el-hina frengi.

The seeds of this plant, the well-known Mignonette of our gardens were sent from Cyrenaica, probably in 1737, by the French explorer Granger (see Ascherson Naturwiss. Wochenschrift 1910, p. 241).

602. (5.) **Reseda lutea** L. Spec. Plant. I (1753), p. 645. — Boiss. Fl. Or. I, p. 429. — Rehbch. Ic. II, fig. 4446. — Ascending or decumbent, somewhat pubescent with short stiff hairs or nearly glabrous; leaves 5—10 cm long, broadly ovate or oblong, deeply lobed or divided, sometimes pinnatifid; segments linear-oblong with undulate margins; flowers in narrow racemes, 4—6 mm broad, greenish yellow; pedicels ascending, about 4 mm long in fruit; petals 6 or 5, all but the lowest irregularly cleft; sepals of the same number; capsule oblong, about 8 mm long, with 3 or rarely 4 short teeth. — Flow. February to March.

M. ma. Hammâm; Behig (Schweinfurth).

Also known from all the other parts of the Mediterranean region, Middle Europe, Caucasia, Asia Minor, Syria and Persia.

603. (6.) **Reseda Boissieri** Müll. Arg. Monogr. Resed. (1857), p. 117. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 44 no. 117. — Reseda kabirina β Boissieri Boiss. Flor. Or. I, p. 430. — Sickenberg. Contrib. Flor. d'Eg., p. 182. — An annual plant, 30—60 cm high, papillose-scabrous, decumbent or ascending. Leaves oblong to oblanceolate, entire or trifid. Racemes loose; sepals linear, somewhat longer than the spathulate lobes of the corolla; pod oblong-obovate, 1 cm long. — Flow. March to April.

D. a. sept. Ain-Musa near Cairo; Wady Rished; Wady Hof; Upper Wady Dugla. = **D. i.** Wady-el-'Arish.

Also known from Syria.

604. (7.) **Reseda muricata** Presl. Bot. Bemerkg. (1844), p. 8. — Boiss. Flor. Or. I, p. 431. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 44 no. 118. — A biennial or perennial plant, 30—50 cm high, muricate, rigid. Lower leaves entire, linear-lanceolate, the others ternate with linear to linear-lanceolate lobes. Flowers 4 mm broad, short-pedicelled, upper petals 7-lobed; filaments deciduous; capsules glabrous, elliptical, 5 mm to 1 cm long; seeds minute. — Flow. March to April.

D. a. sept. Wady-el-Hof; Reseda-valley near Helwân.

Also known from Arabia Petraea and Syria.

605. (8.) **Reseda pruinosa** Del. Ill. Flo. d'Eg., (1813), p. 15. — Boiss. Flor. Or. I, p. 433. — Ascherson-Schweinf. Ill. Fl. d'Eg., p. 44 no. 119. — Sickenberg. Contrib. Flor. d'Eg., p. 182. — *Reseda amblyocarpa* Fres. in Mus. Senck. II, p. 108. — *Reseda Quartiniana* A. Rich. Flor. Abyss. I, p. 13. — *Reseda lurida* Müll. Arg. Mém. Réséd., p. 152. — For Further synonymy see Anderson in Journ. Lim. Soc. V, Suppl. I, p. 6. — An erect or ascending biennial or perennial herb, 30—60 or 90 cm in height, woody below, with minutely pruinose-puberulous or papillose branches, terminating in long, many-flowered, spicate racemes. Leaves entire or 3-fid, narrow-lanceolate or oval or with linear-lanceolate segments, tapering below into a rather long petiole, above to an acute or subacute point, minutely scabrid-puberulous on the midrib beneath or glabrous. Bracts caducous. Capsules obovate-oblong. Seeds minute reniform, minutely punctate under a lens. — Flow. March to April.

M. ma. O. D. l. D. i. D. a. sept. D. a. mer. A common plant on calcareous ground.

Local name: denebân (Klunzinger); khazâme.

Also known N. W. India, Arabia and Tropical Africa.

606. (9.) **Reseda luteola** L. Spec. Plant. I (1753), p. 643. — Boiss. Flor. Or. I, p. 434. — *Luteola tinctoria* Webb Plyt. Can. I, p. 312. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 44 no. 120. — Sickenberg. Contrib. Flor. d'Eg., p. 182. — Biennial, 50 cm to 1 m high, glabrous, stiff, branching from the base. Leaves linear-lanceolate, often wavy, and often denticulate above the base. Flowers nearly sessile; sepals persistent, shorter than the corolla; filaments persistent; fruiting raceme often 50 cm long; capsules stiff, obovate-truncate, 5 cm long and broad, acutely toothed, deeply 6-fluted, the lobes more or less knobbed by transverse constrictions; seeds smooth. — Flow. March to April.

M. ma. N. d. N. v. Cultivated and naturalized.

Local name: bêqem; weybe (Forsk.); generally: bliha.

Also known from Europe, Orient and the Mediterranean region.

255. (3.) **Oligomeris** Camb.

Sepals 2—5. Petals 2, turned toward the axis, entire or lobed. Disk none. Stamens 3, turned toward the axis, somewhat monadelphous at the base, the middle one between, the other two opposite the petals. Capsules chartaceous, gaping at the apex, 4-grooved. — Annual herbs with entire leaves, and minute sessile flowers in slender, spiked racemes.

A small genus, of which the following is the most widely-distributed species. Three or four species occur at the Cape.

607. **Oligomeris subulata** (Del.) Boiss. Flor. Or. I (1867), p. 435. — Müll. Arg. ap. DC. Prodr. XVI, sect. II, p. 587. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 44 no. 121. — *Reseda subulata* Del. Illustr. Flor. d'Eg., no. 464. — *Reseda tridens* Viv. Plant. aeg. dec. 1, p. 6 tab. 2 fig. 2. — Sickenberg. Contrib. Flor. d'Eg., p. 182. — *Obligomeris glaucescens* Camb. ap. Jacquem. Voy. Ind. IV, p. 24 tab. 25. — *Resedella subulata* Webb Plyt. Can. I, p. 107 tab. 11. — An erect or decumbent, glabrous, more or less glaucous herb; the stem sometimes with a few minute scattered setae above. Leaves fasciculate, narrow-linear, entire. Flowers small, sessile or subsessile, in rather loose, elongate, terminal spikes. Bracts minute, alternating with the two smaller anterior sepals. Stamens 3 (or 2?), unilateral. Ovary 8-sulcate below, abruptly narrowed into the 4 erect, connate styles. — Flow. March to May.

M. ma. Abusîr; Mariut; Alexandria-West and -East; Abukîr. — **M. p.** El-^cArîsh. — **N. d. N. f. D. l. D. i. D. a. sept. D. a. mer.** A common herb in deep sandy places and often on calcareous ground.

Local name: denebân; dhenebûn (Schweinfurth).

Also known from Morocco, Tunisia, Algeria, Tripolitania, Arabia, Persia and India and Western North America.

256. (4.) **Ochradenus** Delile.

Calyx 5-fid. Petals 0. Stamens 10—20, inserted on an urceolate disk dilated behind. Ovary sessile, ovoid, 3-cuspidate, closed, with 3 ∞ -ovulate placentas. Fruit baccate. — Much-branched, glabrous shrubs, with divaricate, virgate, often spinescent, at length leafless branches. Flowers small, spicate.

A small genus, with the following wide-spread species.

608. **Ochradenus baccatus** Del. Ill. Flor. d'Eg., p. 15 tab. 31. — Boiss. Flor. Or. I, p. 422. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 44 no. 112. — Sickenberg. Contrib. Flor. d'Eg., p. 182. — An shrubby plant, 1—6 m long, glabrous. Leaves linear. Flowers very short pedicelled. Capsules ovate- or obovate-globular. — Flow. March to April.

D. l. Abu-Roash; Pyramids of Giza. — **D. a. sept.** Everywhere in the Wadies of Arabian desert. — **D. a. mer.** Qoseyr.

Local name: gurdy.

Also known from the other parts of the Sahara-region, Palestine, Arabia, Persia and India.

42. **Moringaceae.**

Flowers irregular, bisexual. Calyx 5-partite, with a short, cupshaped tube and unequal, imbricate, at length spreading or reflexed segments. Petals 5, similar in form to the calyx-lobes; 2 upper-one smaller. Stamens 5, alternating with 5 staminodes or 10, declinate; filaments free, inserted in the margin of the disk; anthers 1-celled, dorsifixed. Ovary 1-celled, stipitate; style terminal, slender; ovules indefinite, anatropous, pendulous, on 3 parietal placentas. Capsule siliquiform, 3—6-angled, 3-valved, many-seeded. Seeds rather large, with or without wings, exalbuminous; radicle superior. — Trees with 2—3-pinnate leaves, clustered at the ends of the branches; leaflets obovate or obovate-oblong, often caducous, or the leaves reduced to the jointed rachis. Panicles ample, hoary or glabrous, of rather large whitish pale yellow or red flowers. Capsules 12—40 cm in length.

A small and anomalous family of doubtful affinity, based upon the single genus of 3 or 4 species. Confined to India, Eastern and Tropical Asia, and warm regions between.

257. **Moringa** Juss.

Shrubs or small trees with irregular, hermaphrodite flowers, a 5-parted calyx with imbricated lobes, the fifth posterior, 5 petals imbricated in the bud, alternate with the calyx lobes, inserted on the tube, perigynous, a disk lining the calyx-tube, 10 stamens inserted at the margin of disk, perigynous, the upper 5 larger, anther bearing, the lower 5 filiform. A free, stipitate, 1-celled ovary, with 3, parietal placentae, and a cylindrical-prismatic, 3—6-angled, beaked, 1-celled, 3-valved capsule. — Ovules numerous, pendulous, anatropous, with a ventral raphe. Style declined, with truncate apex. Seeds exalbuminous, with straight embryo, and short, superior radicle.

A small genus in India, Africa and the warm regions between.

- A. Leaflets usually present at flowering. Seeds
3-alate 1. **M. pterygosperma.**
- B. Leaflets reduced to their jointed, 2—3-pinnate
rachis, or leaflets few at flowering. Seeds not
winged 2. **M. aptera.**

609. (1.) **Moringa pterygosperma** Gaertn. De Fructib. II (1791), p. 314. — DC. Prodrum. II, p. 478. — Boiss. Fl. Or. I, p. 23. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 60 no. 272a. — *Moringa oleifera* Lam. Encycl. I, p. 398. — A small tree, bark corky, wood soft, root pungent; young parts tomentose. Leaves 30—60 cm long, usually

3-pinnate; leaflets elliptic ovate or obovate, nerves obscure, petiole slender, sheathing at the base; petiolules slender; glands linear, hairy. Panicles spreading, bracts linear. Flowers white, pedicelled, 2.5 cm diameter, honey-scented. Sepals linear-lanceolate, reflexed. Petals narrowly spathulate. Fertile filaments villous at the base. Ovary hairy. Pod 18—36 cm long, pendulous, 9-ribbed. Seeds winged, 3-gonous. — Flow. March.

N. d. Cairo, cultivated in gardens; naturalized near Matariya.

Also known from Western Himalaya and cultivated everywhere throughout India.

610. (2.) **Moringa aptera** Gaertn. De Fructib. II (1791), p. 315. — Boiss. Fl. Or. I, p. 23. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 60 no. 272. — Sickenberg. Contrib. Fl. d'Eg., p. 181. — Ic. Decsne Ann. Scienc. Nat. Ser. 2 Vol. XIV, tab. 6. — *Moringa zeylanica* Sieb. Plant. exsicc. — Balanus Myrepsica Belon Observ., p. 126. — *Moringa arabica* Pers. Synop. I, p. 460. — A tree, 4—8 m high or more, glaucescent. Leaves 30 cm long or more; with or without a few scattered obovate or oblanceolate leaflets, 1—2 cm long. Panicles 18—20 cm long, axillary; flowers pale yellow. Capsule about 30 cm long. Seeds 3-gonous, unappendaged. — Flow. February.

D. a. sept. Wady Omm Mumfeyh. — **D. a. mer.** Wady Hamamât; Qoseyr.

Local name: yesar; abad.: māi (Klunzinger); the pods: habbhâly (Wilkinson); bâu (Schweinfurth); habb-el-bâu.

Also known from Abyssina, Syria and Arabia.

Rosales.

Herbs, shrubs or trees, rarely wholly aquatic plants, or vines. Leaves with simple or compound blades. Flowers mostly perfect. Calyx and corolla present and sometimes irregular, or the latter occasionally, or both rarely wanting. Sepals distinct or partially united, commonly confluent with the hypanthium. Androecium of several mostly epigynous or perigynous stamens. Gynoecium of 1 or several distinct or united carpels. Fruit various.

43. Crassulaceae.

Flowers hermaphrodite, regular. Calyx persistent, free, 4—5-rarely 6-partite, or 5-rarely 10-fid. Petals as many as the sepals, free or more or less connate, often persistent, erect or spreading or with the claw erect and the limb spreading. Stamens perigynous

or scarcely hypogynous, equalling or doubling the petals in number, free, or adnate to the petals; filaments filiform or subulate; anthers linear, oblong or didymous, dorsally affixed, dehiscing longitudinally. Scales hypogynous at the base of the carpels, oblong cuneate or linear, rarely longer than broad. Carpels as many as the petals, free or rarely more or less connate, unilocular; styles short or elongated, subulate or filiform; stigmas capitellate, truncate, often oblique. Ovules many, rarely solitary. Follicles membranaceous or coriaceous, many- or few-seeded, dehiscing by the ventral suture. Seeds usually minute, oblong; testa membranaceous or subcoriaceous; albumen fleshy. — Herbs or suffruticose, varying in habit, usually fleshy or succulent, rarely pubescent or pilose. Leaves alternate or opposite, sometimes connate, simple or rarely lacinate or imparipinnate. Flowers usually cymose, with or without bracts.

An Order widely dispersed in temperate and subtropical regions, especially of the Old World.

A. Stamens isomerous with the petals. Petals free or scarcely united at the base.

I. Capsules 2-seeded 1. *Tillaea*.

II. Capsules ∞ -seeded 2. *Umbilicus*.

B. Stamens twice as many as the petals.

I. Calyx shortly 4-fid, large 3. *Bryophyllum*.

II. Calyx 4-partite, rarely 4-fid 4. *Calanchoë*.

258. (1.) *Tillaea* Linn.

Calyx-lobes 3—5. Petals 3—5, free or connate at the base. Stamens 4—5, filaments filiform; anthers 2-celled. Scales 4—5, linear or 0. Ovary of 4—5 free carpels; narrowed into short subulate styles, with minute stigmas; ovules 1 or many in each carpel. Follicles 2- or many-seeded. — Aquatic or terrestrial herbs, often very small, subsucculent, glabrous. Leaves opposite, cylindrical subulate or flat, quite entire. Flowers minute, axillary, solitary or cymose, white or red, often fasciculate.

A genus of wide distribution, scarcely separable from *Crassula*, comprising about twenty species.

611. *Tillaea trichopoda* Fenzl ap. Kotschy Plant. Pers. austr. exsicc. (1845), no. 129. — Boiss. Fl. Or. II, p. 767. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 78 no. 451. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 648 no. 126. — *Tillaea alata* Viv. Plant. aeg. (1831), no. 19. — *Tillaea muscosa* Coss. ap. Letourneux in Bull. Soc. Bot. Franc. XXXVI, p. 95 not L. — An annual plant, 2—3 cm high, stems simple or sparingly branched, flowering from the base. Leaves

oblong-lanceolate, mucronate, connate at the base. Flowers axillary, with pedicels, at length as long as they; calyx-lobes lanceolate, mucronate. — Flow. March to April.

M. ma. Marmarica: Matruqa; Ras-el-Kena'is; Mariut. — **N. d.** Alexandria; Khanka; Birket-el-hagg.

Also known from Tunisia, Algeria, Tripolitania, Syria and Persia.

259. (2.) *Umbilicus* DC.

Calyx 5-parted. Corolla tubular, campanulate, or urn-shaped, more or less deeply 5-cleft. Stamens 10, inserted on the tube of the corolla. Carpels 5, many-seeded. Perennial or annual herbs, with various habit.

A small genus of only a few species in the Mediterranean region.

A. Pedicels longer than the bracts 4. **U. intermedius**.

B. Pedicels shorter than the bracts 2. **U. horizontalis**.

612. (1.) *Umbilicus intermedius* Boiss. Flor. Or. II (1872), p. 769. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 79 no. 454. — *Umbilicus pendulinus* DC. var. *intermedius* Post Flor. Sin. Syria, Palest. and Sin., p. 314. — An perennial herb, 20—50 cm high or more. Upper stem-leaves oblong-cuneate to oblong-linear and linear-subulate, scattered. Flowers pendulous or horizontal, in a simple or branched spike; corolla yellowish-white, tubular, four times as long as the calyx, cleft for one-fourth its length into ovate, acute lobes. — Flow. March to April.

D. i. Desert-el-Tih. — **D. a. sept.** Abundant in the Northern Galâla.

Also known from Armenia, Mesopotamia, Syria, Palestine und Persia.

613. (2.) *Umbilicus horizontalis* DC. Prodrum. III (1828), p. 400. — Boiss. Flor. Or. II, p. 770. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 79 no. 455. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 648 no. 127. — An perennial herb, 15—50 cm high. Upper stem-leaves oblong-cuneate, scattered. Flowers pendulous, with pedicels shorter than the bracts, in a simple or branched spike; corolla yellowish-white, tubular, four or three times as long as the calyx, cleft for one-fourth its length into ovate, acute lobes. — Flow. February to March.

M. ma. Marmarica: Matruqa; Abusîr; Mariut-Bringhi; Mex.

Also known from all the other parts of the Mediterranean region:

260. (3.) *Bryophyllum* Salisb.

Calyx inflated, cylindrical or tetragonous, shortly 4-fid, valvate. Corolla urceolate or subcampanulate, the limb shortly 4-fid, spreading.

Stamens 8, in two rows, inserted in the middle of the corolla-tube; filaments filiform; anthers oblong, shortly exserted. Scales free or adnate to the carpels. Carpels 4, free, or connate at the base. elongate, narrowed into elongated, connivent, exserted styles, with capitellate stigmas; ovules in each carpel numerous-follicles 4, many-seeded. — Tall, stout, fleshy herbs, shrubby at the base. Leaves opposite, petiolate, simple, or unequally pinnate, crenate. Flowers rather large, nodding, in many-flowered paniculate cymes, greenish-white or red; branches of the panicle opposite.

A genus of four species, of which two are confined to Madagascar, and one to the Cape; the fourth is common to the tropics of both hemispheres.

614. *Bryophyllum pinnatum* (Lam.) Ascherson and Schweinf. Ill. Flor. d'Eg. (1887), p. 79 no. 453. — *Cotyledon pinnatum* Lam. Encyclop. II, p. 318. — *Bryophyllum calycinum* Salisb. in DC. Prodrum. III, p. 396. — Shrubby, 60—120 cm high or more. branched from the base, glabrous throughout. Barren stems ascending; flowering stems erect, cylindrical, spotted with dark purple. Leaves fleshy, crenate, ovate orbicular, or unequally pinnate with ovate segments, the terminal one larger than the rest. Flowers $2\frac{1}{2}$ —4 cm long, pendulous. Calyx inflated, 2— $2\frac{1}{2}$ cm long, green, striped with purple at the base. Corolla-tube green below, bright reddish-purple in the exserted portion, globose-octagonal at the base. abruptly constricted immediately above, then produced into an elongated, 4-angled, ventricose tube; limb 4-fid, segments abruptly acuminate, very acute, spreading. Stamens slightly exceeding the corolla-tube. Styles equalling the stamens, erect, filiform. Stigmas sparingly papillose. Squamulae truncate, short, nearly as broad as long, free, or very slightly adhering to the carpels. — Flow. February to March.

N. d. Alexandria-West and -East. cultivated in gardens and often subspontaneous.

Common to the tropics of both hemispheres.

261. (4.) *Calenchoë* Linn.

Calyx 4-partite, rarely 4-fid, segments linear-ovate or subulate, shorter than the corolla-tube, usually deciduous. Corolla hypocrateriform, tube usually urceolate, limb 4-partite, spreading, persistent. Stamens 8, adnate to the corolla-tube, in two series, all antheriferous. filaments rather short; anthers oblong, included. Squamulae 4, linear or oblong. Carpels of the ovary 4, adnate to the base of the corolla-tube, lanceolate, narrowed into slender styles with obliquely truncate stigmas; ovules many, multiseriate. Follicles membranaceous,

many-seeded. — Robust erect herbs or shrubs. Leaves fleshy, opposite, sessile or petiolate, entire crenate or pinnatifid. Flowers rather large, usually in many-flowered paniculate cymes, yellow purple or scarlet.

A genus of about thirty species, having its head-quarters in Tropical Africa, but also represented at the Cape, in Tropical Asia, and in Brazil.

615. **Calenchoë deficiens** (Forsk.) Ascherson and Schweinfurth in Aschers.-Schweinf. Ill. Flor. d'Eg. (1887), p. 79 no. 452. — *Kalanchoë aegyptiaca* DC. Prodröm. III, p. 395. — *Cotyledon deficiens* Forsk. Flor. aeg.-arab., p. LXVI no. 242 and p. 89. — DC. Plant. Grasses, tab. 64. — *Kalanchoë spathulata* DC. Plant. Grasses, tab. 65. — *Cotyledon crenata* Vent. Jard. Malm., tab. 49. — Sims in Bot. Mag., tab. 1436. — *Cotyledon Verea* Jacq. Hort. Schoenbr., tab. 435. — (Of the figures quoted those of DC. and Vent. represent the glabrous form: those of Jacq. and Sims the hispidulous variety.) — Root thick, fibrous. Stem 60—180 cm high, glabrous throughout or hispidulous in the upper portion. Leaves 5—6 cm long, oblong or roundish ovate or spathulate, coarsely crenate, obtuse, cuneate at the base, glabrous, all but the uppermost distinctly petiolate. Petioles 2—3,5 cm long; upper leaves sometimes entire. Inflorescence glabrous or hispidulous in trichotomous many-flowered axillary and terminal cymes; peduncles of axillary cymes long, the lowest 16—18 cm in length; internodes 6—10 cm long. Bracts narrow, lanceolate, petiolate; bracteoles setaceous. Calyx-lobes glabrous or hispidulous and viscid, lanceolate, acute, very slightly cohering at the base, 3—6 mm long; pedicels slender, 3—6 mm long. Flowers bright yellow or orange; tube 1 cm long, glabrous or pubescent; limb-segments oblong-lanceolate, acute. Squamulae linear, 2—2½ mm long. Carpels narrow, 6 mm long. — Flow. March to April.

M. p. Qatiya naturalized in an old Arabic necropolis (Figari). — **N. d.** Old Gardens of Cairo, often naturalized.

Local name: widne.

Also known from Arabian, where the species has its origin.

44. Saxifragaceae.

Sepals 4 or 5, free, or united into a calyx, with the tube wholly or partially adherent and with 4 or 5 lobes or teeth. Petals either as many, perigynous, seldom epigynous or hypogynous, or rarely wanting. Stamens as many, or twice as many, or very rarely more, inserted with the petals, the anthers opening by introrse or lateral slits. Ovary single, either more or less inferior or adherent, or free with a broad base. 2—5-celled, the placentas at the intro-

flexed edges of the carpels, or rarely 1-celled, with 2 or more parietal placentas. Styles as many as cells or placentas, or single, with an entire or lobed stigma. Fruit a capsule or berry. Seeds usually many; albumen copious, rarely wanting.

A considerable Order, ranging over nearly the whole World, the shrubby or arborescent genera chiefly tropical, the herbaceous from the temperate and colder regions chiefly of the northern hemisphere. — In cultivation *Hydrangea Japonica*.

262. *Vahlia* Thunbg.

Calyx-tube campanulate or hemispherical, adherent throughout to the ovary; limb 5-partite, lobes valvate. Petals epigynous, not or scarcely exceeding the calyx. Stamens 5, epigynous. Ovary inferior, 1-celled with 2 pendulous multiovulate placentas; styles 2, stigma capitellate. Capsule many-seeded, dehiscing at the apex. — Herbs, usually pubescent or glandular, erect or diffuse, annual or biennial. Leaves opposite, entire. Flowers axillary, usually geminate, subsessile or pedunculate.

A small genus of Africa and the warmer parts of Asia.

616. *Vahlia viscosa* Roxb. Hort. Beng. (1814), p. 86. — Hook. and Thoms. in Journ. Linn. Soc. II, p. 74. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 79 no. 456. — Sickenberg. Contrib. Flor. d'Eg., p. 239. — *Vahlia Weldenii* Reichbch. Icon. Bot. Exot., p. 91. — DC. Prodrum. IV, p. 53. — *Vahlia sessiliflora* DC. Prodrum. IV, p. 54. — *Bistella geminiflora* Del. Voy. à Meroé, p. 97 tab. II fig. 2. — Annual diffuse or erect branching glandular-pilose or pubescent herb. 15—30 cm or more in height. Leaves ovate, acute or obtuse, sessile or all or the lower only ovate-lanceolate or oval narrowed to the base. 1 to over 3 cm long in luxuriant specimens. Flowers sessile or subsessile, geminate or solitary in nearly all or at least in the upper axils. Calyx-teeth ovate, acute, equalling the campanulate tube. Petals nearly equalling calyx-lobes, ovate-rotundate, slightly narrowed to broad base or obovate-oblong, frequently apiculate. Filaments filiform, with a very minute hairy scale at the base. Styles equalling calyx-lobes. — Flow. March to April.

N. v. Qurna; Silsele; Aswân; Abu Ghôr.

Local name: sufrâ.

Eastwards in Persia and India and in tropical Africa.

45. Rosaceae.

Sepals 5, rarely 4, united into a lobed calyx, either enclosing the ovary, or adhering to it, or quite free. Petals as many, inserted

on the calyx at the base of its lobes, or rarely wanting. Stamens usually numerous, inserted with the petals, free. Ovary of 1, 2 or more carpels usually distinct at the time of flowering, superior, free from the calyx, but sometimes combined even then into a single 2—5-celled ovary which is always inferior or connate with the calyx. Ovules 1 or 2 or rarely more in each carpel. As the fruit enlarges the carpels either remain free or are variously combined with each other or with the calyx; when ripe they are indehiscent, or occasionally open on the inner edge. Seeds without albumen. Embryo with large cotyledons and a short radicle. — Trees, shrubs or herbs with alternate, mostly toothed or divided leaves. Stipules seldom wanting. Flowers either solitary at the end of the years shoot, or in cymes or panicles, or more rarely in lateral branches or racemes.

A numerous Order, more at home in the temperate and cooler parts of the northern hemisphere than in the tropics or southern hemisphere. It includes most of the important cultivated fruits of northern origin, as peaches, plums, apricots, cherries, apples, pears, strawberries, raspberries etc. as well as the rose, with its numberless garden varieties. Of the 5 Egyptian genera *Neurada* is mainly North- and Tropical African; the 4 others are widely spread in temperate regions.

- A. Ripe carpels not enclosed within the calyx-tube.
 - I. Calyx persistent, ebracteolate 1. **Rubus.**
 - II. Calyx persistent, bracteolate 2. **Potentilla.**
- B. Ripe carpels enclosed in the calyx-tube.
 - I. Carpels 1—3; ovule 1. Achenes enclosed in the dry calyx-tube, which is constricted at the mouth.
 - Petals 0 3. **Poterium.**
 - II. Carpels many, included in the globular receptacular cavity; ovule 1.
 - a) Shrubs. Leaves pinnate. Petals conspicuous,
 - 5. Carpels ∞ , free, enclosed in the receptacle or calyx-tube which is constricted at the mouth 4. **Rosa.**
 - b) Herbs. Leaves simple, lobed or cut. Carpels 5—10, more or less consolidated with the calyx-tube. Petals minute. Calyx-lobes bracteolate 5. **Neurada.**

263. (1.) **Rubus** Linn.

Calyx free, deeply 5-lobed, persistent. Petals 5. Stamens numerous. Carpels numerous, with 2 pendent ovules in each, only one of which matures. Styles subterminal. Fruit a kind of granulated berry, formed by the union of the succulent carpels round the

conical or shortly oblong dry receptacle. — Scrambling or suberect shrubs, sometimes herbaceous, usually prickly. Leaves pinnately or palmately divided into distinct segments or leaflets, or rarely simply lobed. Flowers axillary or in terminal leafy panicles. Stipules adnate to the petiole.

A large genus, generally diffused through both hemispheres, but most numerous in perplexing varietal or specific forms in North temperate zone.

617. **Rubus sanctus** Schreb. Ic. Pl. (1766), p. 15. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 73 no. 423. — Ascherson-Schweinf. Primit. Flor. Marmaric., p. 647 no. 122. — Sickenberg. Contrib. Flor. d'Eg., p. 228. — *Rubus discolor* Boiss. Flor. Or. II, p. 695. — Shrub. Prickles strong, claw-like. Leaves ternate or lowermost quinate; leaflets glabrous or sparingly puberulent, pale green above, pinnous below, ovate or orbicular, obtuse, acute or acuminate; petiole planoconvex above. Terminal raceme compound; flowers pink; fruits with many carpels. — Flow. January to March.

M. ma. Marmarica: Bir-el-qasaba; Matruqa; Alexandria-West and -East. — **M. p.** Rosetta; Damietta. — **N. d. N. v.** Cairo Matariya.

Local name: Tut shôky.

Also known from other parts of the Orient.

264. (2.) **Potentilla** Linn.

Flowers usually 5-merous. Calyx-tube short, lobes erect or spreading, alternating with as many bracteoles of an epicalyx. Petals obcordate to oblanceolate. Stamens indefinite. Carpels indefinite inserted upon a small dry receptacle. Achenes sessile, pericarp crustaceous. — Herbs (or shrubs). Leaves digitately or pinnately 3—5— ∞ -foliolate; leaflets usually incised or serrate. Stipules adnate below to the petiole. Flowers pedicellate in corymbose cymes or solitary and axillary or leaf-opposed, yellow in our Egyptian species.

A large genus of the colder and temperate regions of the northern hemisphere, rare southwards.

618. **Potentilla supina** L. Spec. Plant. I (1753), p. 497. — DC. Prodrum. II, p. 574. — Boiss. Flor. Or. II, p. 275. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 74 no. 424. — A diffuse decumbent herb, from a few an 30 cm or more in height, branching from the base, usually more or less pilose. Lower leaves pinnately 5-foliolate, upper 3-foliolate with shorter petioles; stipules linear-oblong to ovate entire. Leaflets from oblanceolate to obovate or (in basilar leaves) sometimes nearly ovate, obtuse, incise-serrate. Peduncles leaf-opposed equalling or shorter than the upper leaves, at length recurved.

Bracteoles of the epicalyx lanceolate or oblong, nearly equalling the calyx. Petals yellow obovate or oblanceolate, scarcely equalling the calyx. — Flow. March to April.

N. d. Damanhur, in ditches; Kafr Zayât; Zaqaziq; Qalyub; Cairo, everywhere in saqqiyes. — **N. v.** Banks of the Nile, everywhere, abundantly.

Local name: zaghlûl (Ascherson).

Widely spread in Europe and Asia; occurs also in Tropical Africa and in the Cape.

265. (3.) **Poterium** Linn.

Herbs, with a perennial stock, ascending or erect annual stems, and pinnate leaves, rarely shrubs. Flowers without petals, in dense, globular or ovate heads at the ends of long peduncles, most frequently monoecious. Calyx in the male flowers 4-lobed, the stamens numerous, with long filaments. Calyx in the female flowers tubular, contracted at the mouth, with 4 small deciduous teeth. After flowering it becomes quadrangular, closely enclosing 1 or rarely 2 1-seeded carpels.

A small genus, chiefly south European and western Asiatic, generally preferring drier and more rocky situations.

619. **Poterium verrucosum** Ehrenberg. Ind. Hort. Berol. (1829). — Boiss. Flor. Or. II, p. 754. — *Sanguisorba verrucosa* A. Br. Ind. sem. Hort. Berol. (1867) App. I, p. 13. — Perennial shrub. Heads corymbose paniculate; fruits 4 mm long, ovate or spherical, obsoletely 4-angled, beset with elongated, obtuse tubercles, crests of angles indistinct, tubercled like those of the face. — Flow. March.

M. ma. Mariut; Alexandria.

Local name: blinish (Ascherson) zeyte (Schweinfurth).

Also known from Morocco, Algeria, Tunisia, Southern Europe and Arabia Petraea.

266. (4.) **Rosa** Linn.

Flowers rather large, hermaphrodite. Calyx-tube dilated, narrowed at the mouth; limb 5-partite, segments spreading entire or pinnately toothed. Petals 5, sessile, spreading. Stamens indefinite, inserted in mouth of calyx-tube; filaments free, filiform. Carpels indefinite, free, sessile at the base of the calyx-tube; ovary 1-celled, with a pendulous ovule. Achenes indefinite, included in the fleshy persistent calyx-tube. — Shrubs, often scandent; usually aculeate. Leaves alternate.

imparipinnate; stipules adnate to the petiole. Flowers solitary, or in corymbose cymes, white, red or yellow.

A considerable genus, several of the species of which are very variable; most abundant in the north temperate zone of the Old World.

620. **Rosa bracteata** Wendl and Bot. Beob. (1798), p. 50. — *Rosa involucrata* Aschers.-Schweinf. Ill. Fl. d'Eg., p. 73 n. 422 not Roxb. — *Rosa Lyellii* Lindl. Monogr. Ros., p. 12 tab. 1. — *Rosa Lindleyana* Trat. Ros. I, p. 190. — *Rosa palustris* Buch. msr. — A stout bush, erect or with arching subscandent branches; prickles often in stipular pairs, compressed. Leaves 6—12 cm long; leaflets 3—4 pair, 2—3 cm long and less, elliptic or oblong, acute or acuminate, finely serrate, shining above, glabrous on both surfaces or tomentose on the under; stipules small, laciniate. Flowers 5—6 cm diameter, white, fragrant, solitary or in short corymbs, rarely axillary and longer pedicelled; peduncles and pedicells sometimes with glandular hairs; bracts more or less glandular-serrate, especially below. Calyx-tube ovoid; lobes caudate-acuminate, quite entire, deciduous. Petals retuse. Fruit globose, densely tomentose; mass of stigmas discoid, exserted; achenes very many $\frac{1}{2}$ cm long, pale. — Flow. March.

N. d. Matariya. — **N. v.** Island of Roda. subspontaneous; naturalized between the reeds near Mehallet-Rôh.

Local name: Ward.

Also known from British India, Birma and along the Lower Himalaya from Kumaon eastwards.

267. (5.) **Neurada** Linn.

Calyx-tube shallow, cupuliform, at length nearly flat below, depressed conical above, contracted and shortly 5-lobed at the mouth, lobes deltoid or ovate-lanceolate, alternating with as many exterior subulate or at length aculeiform bracteoles. Petals 5, inserted in throat, obovate-cuneate or oblanceolate, very small and little exceeding the calyx. Stamens 10 (or thereabouts), short, distinct, inserted in throat of calyx; anthers 2-celled. Carpels 10 (or more?), more or less coherent and adnate with the calyx; ovaries, at least the outer whorl, horizontal, narrowed into the scarcely exserted styles. Ovule solitary. Fruit dry, orbicular, depressed-conical, spinose-muricate, tomentose, often persisting long after germination of one or more of its seeds. — Annual, prostrate herbs, with minute stipules.

A small genus in the Mediterranean region of North Africa.

621. **Neurada procumbens** L. Spec. Plant. I (1753), p. 631. — Boiss. Flor. Or. II, p. 735. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 74

no. 426. — Sickenberg. Contrib. Flor. d'Eg., p. 228. — Lam. Ill., tab. 393. — *Figaraea aegyptiaca* Viv. Plant. aeg. Dec., tab. I. — An annual herb, 10—15 cm long or more. Woolly-canescens; stems prostrate, spreading, alternately branched, at length woody. Leaves 1,5—2 cm long, ovate-oblong, obtusely sinuate-pinnatifid. Flowers solitary, axillary, peduncled; fruit 1,5 cm broad. — Flow. March to April.

M. ma. Abusir; Alexandria-West and -East; Mandara; Abukir, in deep sandy places. — **M. p.** Rosetta; Damietta; El-'Arish. — **D. l. D. i. D. a. sept. D. a. mer.** Abundant in deep sandy places.

Local name: sa'adân; luseyq (Ascherson) shubbeyt.

Also known from the other parts of the Mediterranean region.

46. Leguminosae.

Sepals combined into a single calyx, more or less divided into 5 or fewer teeth or lobes, rarely entirely distinct. Corolla of 5 or rarely fewer petals, perigynous or rarely hypogynous, very irregular in the third suborder, less so in the second, small and regular in the first. Stamens twice the number of petals, rarely fewer, or sometimes indefinite, inserted with the petals. Ovary single (consisting of one carpel), with 1, 2 or more ovules arranged along the inner or upper angle of the cavity. Style simple. Fruit a pod, usually flattish and opening round the margin into 2 valves, but sometimes indehiscent or variously shaped. Seeds with 2 large cotyledons, a short radicle, and (with few exceptions) without albumen. — Herbs, shrubs, trees or climbers. Leaves alternate, or in a few genera opposite, usually furnished with stipules, compound or simple (reduced to a single leaflet or to an expanded petiole), the leaflets or simple leaves entire or rarely toothed. Flowers in axillary or terminal racemes or spikes, when terminal often becoming leaf-opposed by the growth of a lateral shoot, rarely solitary.

The largest natural Order next to *Compositae*, and widely distributed over the whole surface of the globe. Next to *Gramineae* it is the most serviceable to man for food; and it produces more substances used in the arts and medicine than any other family.

- A. Flowers regular, small. Petals valvate, generally connate below the middle. Radicle straight . . . **Mimosoideae.**
- B. Flowers irregular, but not papilionaceous. Calyx parted to the disk. Petals imbricated, the uppermost the inmost. Radicle superior, straight. Stamens usually free : **Caesalpinioideae.**

C. Corolla papilionaceous, calyx united beyond the disk.

Petals imbricated, the uppermost exterior. Radicle
 niflexed, accumbent on the cotyledons, or straight,

short **Papilionaceae.**

Suborder I. **Mimosoideae.**

Flowers regular, usually 5-merous (4—6-merous). Sepals usually connate in a 5-toothed or-lobed calyx. Petals as many as sepals, free or connate, hypogynous or subperigynous, valvate in aestivation. Stamens as many or twice as many as petals or indefinite, free or monadelphous; anthers minute, dehiscing longitudinally. Seeds elliptical or roundish compressed. Albumen 0 or sparing. Radicle short, straight. — Shrubs or trees, rarely herbaceous. Leaves bipinnate. Flowers small, sessile or shortly pedicellate, capitate or spicate.

Of the 30 genera of this Suborder, 3 are represented in Egypt. Not one is peculiar to this flora.

- A. *Adenanthereae*. — Calyx valvate. Stamens 10 (rarely 5); anthers with a deciduous apical gland. Flowers spicate. Legume subterete, indehiscent, with septa between the seeds 1. **Prosopis.**
- B. *Eumimoseae*. — Calyx valvate or setaceous and rudimentary. Stamens 5 or 10 2. **Mimosa.**
- C. *Acacieae*. — Calyx valvate. Stamens indefinite, free or consolidated at the base only with the disk; pollen grains cohering in masses 3. **Acacia.**

267. (1.) **Prosopis** Linn.

Flowers 5-merous, sessile or subsessile. Calyx 5-toothed or 5-fid. Petals free (or connate below), oval, valvate, at the base very shortly consolidated with the disk and base of the filaments. Stamens 10, free, exserted; anthers obovate-rotundate, with a sessile incurved or anticus gland between the divergent apices of the cells. Ovary subsessile, oblong, multiovulate; style slender, stigma terminal, minute, concave. Legume usually straight, subterete, with a thick hard pericarp transversely septate between the albuminous seeds. — Trees or shrubs, armed or unarmed. Leaves bipinnate, leaflets firm or subrigid. Stipules 0 or inconspicuous. Flowers small, in dense axillary spikes.

Most of the species are American.

622. **Prosopis Stephaniana** (Willd.) Spr. System. II (1825), p. 726. — Boiss. Fl. Or. II. p. 634. — Deless. Ic. III, tab. 75. —

Aschers.-Schweinf. Ill. Flor. d'Eg., p. 71 no. 413. — *Lagonychium* Stephanianum M. Bieb. Flor. Taur. Cauc. III, p. 288. — *Acacia* Stephaniana Willd. Spec. Plant. IV, p. 1088. — *Acacia heterocarpa* Del. Illustr. Flor. d'Eg., p. 79. — An unsightly, straggling shrub, 3 cm to 1 m high, with scattered, conical, 3 mm long prickles, and pubescent twigs and petioles. Pinnae of 3—5 pairs; leaflets 8—12 pairs, linear-oblong, 2—4 mm long. Spikes longer than the leaves; pod ovoid-oblong, 3 cm long, 1.5 cm broad, incurved or more or less constricted and deformed, brownish-black. — Flow. March to March.

N. d. Kafr Ibrahim; Belbeys. — **O.** Siwa; Little Oasis; Farâfra; Dakhel; Great Oasis. — **D. l.** Abu Roash. — **D. a. sept.** Siut; Aswân. — **D. a. mer.** Qoseyr.

Local name: 'uqeyl (Schweinfurth); shilshillâwy; fâragh or fâregh; junbût; 'aqûl (Muschler).

Also known from Arabia Petraea Western Asia to Turkestan and Afghanistan.

268. (2.) *Mimosa* Linn.

Flowers small, capitate (or spicate), 4—5-merous. Calyx minute, campanulate, dentate or irregularly lacinate with setaceous segments. Petals connate more or less or nearly free, valvate. Stamens (as many as or) twice as many as petals, free, exserted; anthers small, eglandular; "pollen-grains indefinite". Legume oblong or linear, usually flat, valves separating entire or in transverse articles from the persistent sutural replum. — Herbs, shrubs or trees, sometimes scandent, aculeate or unarmed. Leaves bipinnate, often sensitive; petiolar glands rarely present. Pedunculate heads (or spikes) axillary or racemose towards the extremities, solitary or fascicled.

A large chiefly Tropical American genus, with few outliers in the Old World. Of the following, *M. asperata* is a common species in both hemispheres.

623. *Mimosa asperata* L. Spec. Plant. I (1753), p. 317. — Benth. in Hook. Journ. Bot. IV (1842), p. 400. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 71 no. 414. — *Mimosa polyacantha* Willd. Spec. Plant. IV, p. 1034. — DC. Prodrôm. II, p. 428. — Boiss. Flor. Or. II, p. 634. — *Mimosa Habbas* Del. Illustr. Flor. d'Eg., p. 111. — *Mimosa procumbens* Schum. and Thonn. Plant. Guin., p. 324. — A much branched prickly and coarsely setulose-pubescent hirsute or strigillose shrub, often attaining several feet. Prickles sharply pointed, straight, or reflexed from a vertically dilated base. Leaves strigose hispid or pilose, usually with slender prickles between the subopposite pinnae; pinnae usually from 7—16 pairs; leaflets crowded, usually 25—40-jugate,

linear, more or less acute, strigose strigose-ciliate or glabrate, usually from $2\frac{1}{2}$ —8 mm long. Peduncles axillary, at length stout, 1— $2\frac{1}{2}$ cm long, solitary or towards the ends of the branches 2 or 3 from each axil. Capitula whitish rose or purple. Flowers 4-merous. Calyx minute, irregularly laciniate with setaceous teeth. Legume oblong or linear-oblong, straight or falcate, compressed, densely strigose-hirsute, apex rounded usually tipped with the remains of the style; valves breaking up into numerous narrow transverse articles, which separate from the slender sutural replum; $2\frac{1}{2}$ —6 cm long, 1 cm broad, on a stipes of 1—3 lines or sessile. — Flow. March to April.

N. v. Edfu; Gebel Silsile; Kom-Ombo; Aswân.

Local name: habbâs.

Also known from Tropical Africa and the Orient.

269. (3.) **Acacia** Linn.

Flowers capitate or spicate, sessile or very shortly pedicellate, usually 5—4-merous. Calyx campanulate or funnel-shaped, toothed or lobed. Petals free or united more or less, valvate. Stamens indefinite, exserted, free or consolidated at the base with the disk; anthers minute; "pollen usually cohering in 2—4 masses in each cell". Ovary sessile or stipitate; ovules few or many; style slender with a small terminal stigma. Legume usually linear or oblong, flat, convex or terete, straight, falcate or twisted, membranous coriaceous or woody, 2-valved or indehiscent, continuous or septate within; very rarely separating into articles. Seeds compressed. — Trees or shrubs, in Egyptian species usually spinose. Leaves bipinnate. Stipules spinescent, inconspicuous or submembranous. Bracts usually cohering in an involucre towards the middle, or at one extremity of the peduncle.

A very large genus, one half Australian, the remainder dispersed over the warmer regions of the Globe.

A. Flowers spicate.

I. Stipules spinose 1. **A. albida**.

II. Stipules not spinose 2. **A. laeta**.

B. Flowers capitate.

I. Legume constricted between the seeds . 3. **A. arabica**.

II. Legume falcate, not twisted, not exceeding 8 mm broad.

a) Pinnae 3—10 pairs 4. **A. Seyal**.

b) Pinnae 1—2 pairs 5. **A. Ehrenbergiana**.

III. Legume spirally twisted.

a) Legume puberulous 6. **A. spirocarpa**.

b) Legume glabrous 7. **A. tortilis**.

624. (1.) **Acacia albida** Delile Ill. Flor. d'Eg. (1813), p. 142 tab. 52 fig. 3. — Boiss. Flor. Or. II, p. 637. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 72 no. 420. — *Acacia saccharata* Benth. in Lond. Journ. Bot. (1842), p. 505. — *Acacia gyrocarpa* Hochst. in Schimp. Pl. Abyss. — A large tree, much divaricately branched, with whitish or pale grey bark; extremities wholly glabrous or puberulous. Stipular spines straight, spreading, rather stout at the base, usually not exceeding 1—2 cm, frequently much shorter or rudimentary. Leaves glabrous or puberulous; rachis usually from 1—6 cm in length with a sessile gland between each of 4—6 (2—8) pairs of pinnae; leaflets oblong, mucronulate, the midrib very oblique, in 7—17 pairs, $2\frac{1}{2}$ —6 mm long. Spikes axillary, solitary or geminate, with peduncle $3\frac{1}{2}$ —10 cm long. Flowers sessile, white, sweet-scented, glabrous or pubescent. Calyx short, cupuliform, broadly toothed, glabrous or puberulous. Petals free nearly from the base, 4 times longer than calyx. Legume flat, oblong, arcuate, often sinuous on the outer suture, valves coriaceous, often transversely nerved and reticulate or at length smooth, 4—8 or 15 cm long, 1—2 cm broad, on a very short stipes. — Flow. February.

N. v. O. D. l. D. a. mer. Abundantly subsontaneous and often cultivated.

Local name: harrâz.

Also known from Nubia, Abyssinia and Senegalia.

625. (2.) **Acacia laeta** R. Br. in Salt Abyss. Plant. App. (1814), p. 56. — Schweinf. Acac.-Arten d. Nilgeb., p. 367 tab. 19, 20, 21. — Boiss. Flor. Or. II, p. 638. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 72 no. 421. — Benth. in Hook. Journ. Bot. (1842), p. 508. — A small or moderate-sized tree, wholly glabrous. Extremities brown, smooth, with short black and shining hooked infra-stipular prickles, or wholly unarmed. Leaves glaucous, scarcely exceeding 4—6 cm in length; pinnae loose in 2—3 pairs; leaflets oblanceolate- or obovate-oblong oblique, obtuse, often mucronulate, subsessile, in 3—5 pairs; 0.5 to 1.5 cm long, $2\frac{1}{2}$ —5 mm broad above. Spikes axillary, solitary or fascicled, equalling or exceeding the leaves. Flowers subsessile. Calyx broadly and shortly toothed. Petals at least at first united about $\frac{2}{3}$ their length. Ovary glabrous, shortly stipitate. Legume flat, oblong, often once or twice constricted owing to abortion of seeds, obtuse or pointed; valves thinly coriaceous, transversely reticulate, glabrous, shortly stipitate, 3—6 cm long, 1—2 cm broad. — Flow. March to April.

N. v. Islands of the Nile; Cataractes.

Also known from Abyssinia and Nubia.

626. (3.) **Acacia arabica** Willd. Spec. Plant. IV (1805), p. 1085. — Benth. in Hook. Lond. Journ. Bot. (1842), p. 500. — Boiss. Fl. Or. II, p. 635. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 72 no. 415. — *Acacia vera* Willd. Spec. Plant. IV, p. 1085. — Tree varying much in size in different districts: extremities glabrous or shortly pubescent-tomentose. Stipular spines straight or nearly so, slender or rather stout below, varying from 0—3 or —6 cm. Pinnæ usually in from 3—12 pairs, rachis glabrous or pubescent with or without a sessile gland between the lowest and occasionally 1 or 2 of the upper pairs; leaflets linear-oblong, obtuse, glabrous, or thinly ciliolate, 5—6 cm long, in 10—30 pairs. Peduncles 2—6 from each upper axil, occasionally somewhat racemose at the extremities, 1—2½ cm long, pubescent, bearing the involucre not far from the middle. Flowers capitate. Calyx shortly and obtusely lobulate. Petals united nearly throughout, twice as long as the calyx. Legume linear, straight or slightly curved, compressed, moniliform, the constrictions usually deep, each article flat or convex, smooth, varying from 1 to over 2 cm in diameter, valves coriaceous, pubescent-tomentose or glabrous; 8—12 cm long on a stipes of 1—2 cm. — Flow. March.

N. v. Esne: Deyr-el-shehhâet (Schweinfurth).

Also known from Abyssinia and Nubia.

var. **nilotica** (Forsk.) Aschers.-Schweinf. Illustr. Flor. d'Eg., (1887), p. 472 no. 415. — Boiss. Fl. Or. II, p. 635. — *Acacia nilotica* Del. Ill. Flor. d'Eg. (1813), p. 3. — Pods glabrous. — Flow. December to April.

N. d. N. f. N. v. O. D. I. Spontaneous and subspontaneous and cultivated everywhere.

Local name: sant; (pods ==) qarad.

Also known from the whole Nile region.

627. (4.) **Acacia Seyal** Delile Ill. Flor. d'Eg., (1813), tab. 52 fig. 2 p. 384. — Boiss. Flor. Or. II, p. 636. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 72 no. 418. — A small or medium-sized tree; extremities glabrescent or glabrous or obsoletely puberulous; bark brown or reddish-brown. Stipular spines patent, 2—5 cm long, rather slender, at length ivory-white, toward the extremity of flowering branches frequently very short recurved. Leaves glabrous; pinnæ in 3—9 pairs; rachis usually with at least one gland; leaflets linear-oblong, obtuse, in 8—20 pairs, 2—6 cm long. Peduncles 1—5 from each node, occasionally shortly paniced or racemose, 0.75—5 cm long, glabrous, bearing the deciduous involucre below the middle. Flowers capitate. Calyx-teeth short, obtuse. Petals united ¾ their length or more, twice as long as the calyx. Legume linear, falcate,

slightly but distinctly broadly constricted between the longitudinally disposed seeds, narrowed at each end; valves coriaceous, longitudinally areolate-nervose, 6—12 cm long, 5—10 mm broad. — Flow. March.

N. v. O. (Great Oasis.) — **D. l. D. a. mer.** Common.

Local name: seyâl (Delile); generally talh.

Also known from Nubia, Abyssinia, Senegalia and Arabia Petraea.

628. (5.) **Acacia Ehrenbergiana** Hayne *Arzneigewächse* IX (1845), p. 29. — Boiss. *Flor. Or. II*, p. 636. — Aschers.-Schweinf. *Ill. Flor. d'Eg.*, p. 72 no. 419. — Schweinf. *Akaz. d. Nilgeb.*, p. 352 tab. 15 and 16. — A shrub; extremities smooth, shining, chestnut-brown. Stipular spines usually exceeding the leaves, slender, spreading, straight. Leaves small, puberulous or glabrate; pinnae 1—2-jugate, leaflets 8—10-jugate, oblong, obtuse, midrib obscure, 2—4½ mm long. Flowers capitate. Peduncles solitary or fascicled in the axils, exceeding the leaf, bearing the involucl near or below the middle. Petals united $\frac{2}{3}$ their length, twice as long as the calyx. Legume narrow-linear, falcate, broadly constricted between the seeds, varying to 8½ cm in length. — Flow. March to April.

N. v. Esne; Luksor; Aswân. — **D. l.** Zawîyet-el-Arṣan. —

D. a. sept. D. a. mer. Rare, on calcareous ground.

Local name: samleh; generally: salam; selem.

Also known from Nubia, Abyssinia and Arabia Petraea.

629. (6.) **Acacia spirocarpa** Hochst. in Schimp. *Plant. abyssin. exsicc.* — Boiss. *Flor. Or. II*, p. 635. — Aschers.-Schweinf. *Ill. Flor. d'Eg.*, p. 72 no. 416. — Schweinf. *Acac. d. Nilgeb.*, p. 322 tab. 4—6. — A low umbrella-like tree; extremities red-brown, pubescent. Stipular spines spreading, straight, slender, varying in length to 5 cm occasionally on the same branch, very short, hooked, or obsolete. Leaves in our specimens very short, 1—6 cm long, petioles pubescent; pinnae in 4—10 pairs; leaflets very small, oblong, in 7—15 pairs. Peduncles 1 or few, axillary, 5—8 mm long, bearing the minute involucl below or near the middle. Flowers capitate. Pod spirally twisted or contorted, linear, compressed, slightly constricted between the seeds, valves coriaceous, longitudinally nerved, pubescent or puberulous. 6—12 cm long, 5—8 mm broad. — Flow. March to April.

D. a. mer. Qoseyr; Alreṣq; Tundeba; Wady Gadîn; Wady Gemâl; Sherm Luliya; Gebel Ferâye.

Local name: sammur (Schweinfurth-Klunzinger).

Also known from Abyssinia, Nubia and Arabia Petraea.

630. (7.) **Acacia tortilis** Hayne *Arzneigew.* IX (1845), p. 31. — Boiss. *Flor. Or. II*, p. 635. — Aschers.-Schweinf. *Ill. Flor. d'Eg.*, p. 72

no. 417. — Schweinfurth *Acac. Nilgeb.*, p. 327. — A tree; wholly glabrous, the extremities brown or reddish-brown. Stipular spines on the flowering branches very short, slightly recurved, on barren branches 2.5 cm long, straight. Pinnae in 2—5 pairs, glands of the rachis when present very minute; leaflets in 8—12 pairs, linear-oblong, obtuse, $2\frac{1}{2}$ —7 mm long. Peduncles 1—5 from each axil, slender, bearing a small involucre near or a little below the middle. Flowers capitate. Calyx-teeth short. Petals twice as long as the calyx. Pod flat, coriaceous, narrow-linear, spirally twisted, rather strongly longitudinally nerved, glabrous, 6—12 cm long, 5—6 mm broad. — Flow. March to April.

N. v. D. l. D. i. D. a. sept. D. a. mer. Abundantly everywhere.

Local name: seyâl; talh (in the Libyan desert, Ascherson).

Also known from Nubia and Abyssinia and the Northern Sahara (to Southern Tunisia).

Suborder II. **Caesalpinioideae.**

Flowers irregular, more rarely regular, 5-merous. Sepals 5, 2 posterior sometimes coherent throughout, connate below or free to the base, imbricate or rarely valvate, occasionally spathaceous, rarely obsolete or reduced to minute scales. Petals 5 or fewer by abortion or 0, posterior included in aestivation. Stamens 10 or fewer by abortion, rarely more, free or mon- or diadelphous; anthers various. Ovary sessile or stipitate, styles often adnate to the calyx-tube. Seeds various, with or without albumen. — Trees, shrubs, or rarely herbaceous. Leaves alternate, usually pinnate, leaflets alternate or unimultijugate or bipinnate, more rarely unifoliate or simple. Inflorescence very various.

- A. *Eucaesalpinieae*. — Leaves bipinnate. Calyx divided to the disk. Petals usually 5, subequal or but slightly unequal. Stamens 10 4. **Caesalpinia**.
 B. *Cassieae*. — Leaves simple pinnate. Sepals 5, distinct or calyx-lobes free to the disk. Petals 5 or fewer or 0. Stamens 2—10, anthers basi or dorsifixed . 5. **Cassia**.

270. (4.) **Caesalpinia** Linn.

Calyx-lobes 5, imbricate, the lower outside and often larger. Petals 5, orbicular or obovate, nearly equal or the upper smaller. Stamens 10, free; filaments usually pubescent or glandular at the base; anthers uniform, dehiscing longitudinally. Ovary sessile or subsessile, free, inserted at the base of the short calyx-tube; style usually filiform with a terminal truncate, concave, sometimes sinuate

stigma; ovules usually few. Pod ovate, elliptical, oblong or falcate, compressed, exalate, coriaceous, 2-valved or slowly dehiscent or indehiscent. Seeds transverse, usually separated by cellular partitions, exalbuminous, or albuminous, with a short straight radicle. — Trees or shrubs, sometimes climbing, with or without prickles. Leaves bipinnate. Flowers yellow to red, often handsome, in simple or paniced racemes.

About 38 species, dispersed over the tropical regions of both Worlds.

631. **Caesalpinia sepiaria** Roxb. Hort. Beng. (1814), p. 32. — Flor. Ind. II, p. 360. — Ascherson-Schweinf. Ill. Fl. d'Eg., p. 70 no. 407. — Sickenberg. Contrib. Fl. d'Eg., p. 244. — Branches more or less densely coated with grey or brown pubescence. Prickles small, copious, hooked, pale-brown. Leaves 25–30 cm long; pinnae 12–20, distinctly stalked; leaflets 16–24, small oblong, very obtuse 1 to 2.5 cm long, green and glabrous above, glaucous and slightly pubescent beneath. Racemes simple, distinctly peduncled, 15–30 cm long; pedicels rigidly erecto-patent, twice the length of the calyx. Calyx 1–2 cm long, more or less pubescent; corolla 1 cm bright, yellow, stamens little exerted, filaments densely woolly in the lower half. Pods oblong-ligulate, subtergird, veined, 4–8-seeded, 6–10 cm by above 2 cm, sublignose, glabrous, rather recurved, with the upper suture dilated into a narrow wing, subindehiscent.

N. d. N. v. In gardens cultivated and often subsontaneous.

India extending to Himalaya and Ceylon, China, Japan and introduced in Tropical America.

271. (5.) **Cassia** Linn.

Calyx-tube very short, segments 5, imbricate in aestivation. Petals 5, subequal or the anterior larger, imbricate. Stamens 10, all perfect and subequal or 3 or 5 wanting or imperfect; anthers uniform or 2 or 3 anterior larger, 2-celled, dehiscing by terminal pores or longitudinally more or less from the apex. Ovary sessile or stipitate, frequently arcuate; style short or long; stigma terminal; ovules several or numerous. Pod terete or flattened, indehiscent or 2-valved, with or without transverse internal septa; rarely winged or appendaged. Seeds albuminous flattened at right angles to or parallel with the valves, rarely rhomboid-subterete, transverse or rarely longitudinally disposed in the pod. Cotyledons plane or sinuous. — Trees, shrubs, or herbs. Leaves abruptly pinnate; common petiole frequently with sessile or stipitate glands, either solitary near the base or interpetiolular. Stipules various. Flowers yellow or red,

in axillary or terminal racemes, corymbs or fascicles; occasionally solitary or geminate in the axils.

A very large genus of warm and tropical countries, both of the New and Old World, especially abundant in the former.

- A. Flowers in axillary fascicles racemes or corymbs shorter than the leaves, or confluent above and terminal. Sepals nearly equal. Two anterior stamens longer. Pods terete or flattened, unappendaged, 6—15 times longer than broad.

- I. Leaflets 5 pairs. Petiole with obtuse gland near the base 1. *C. occidentalis*.
 II. Leaflets 6—9 pairs. Petiole with small gland near the base 2. *C. Sophera*.
 III. Leaflets 3—4 pairs 3. *C. bicapsularis*.

- B. Flowers in axillary (or subterminal) many-flowered, often elongate racemes. Sepals nearly equal. Two anterior stamens larger. Pods flattened.

- I. Valves of pod with a row of crest like plaits; leaflets obtuse 4. *C. obovata*.
 II. Valves of pod unappendaged; leaflets acute 5. *C. acutifolia*.

632. (1.) **Cassia occidentalis** L. Spec. Plant. I (1753), p. 351. — Boiss. Flor. Or. II, p. 632. — DC. Prodr. II, p. 497. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 71 no. 411. — *Cassia planisilqua* L. ex Bot. Reg., tab. 83. — Stem firmly herbaceous or woody below, annual or of 2—3 years' duration, erect, often forming dense bushy masses, a few feet in height, glabrous or nearly so. Leaflets membranous, in 4—5 pairs, ovate- or elliptic-lanceolate, usually acute or acuminate, glabrous minutely ciliate or obsoletely pubescent beneath, 2—6 cm long, the upper varying to 6—8 cm; common petiole without interpetiolar glands, but with a short obtuse gland near the base, black when dry. Stipules lanceolate or ovate-lanceolate, membranous, deciduous. Flowers in short few-flowered axillary racemes or fascicles, the peduncle and pedicels seldom exceeding 2 cm, or towards the ends of the branches the fascicles confluent forming an interrupted terminal raceme; the leaves reduced or bract-like. Bracts thin, linear-lanceolate or oblong acuminate, deciduous. Sepals obtuse, glabrous or nearly so, the outer rather shorter. Petals obtuse, venose. Two anterior stamens larger, with slightly curved anthers 5 mm long, shortly and broadly produced at the apex. Legume 2-valved, linear compressed, slightly falcate or straight, apiculate, rather coriaceous, margined with straight sutures; 6—10 cm long, 6—8 mm broad; the pericarp when dry usually depressed between the seeds,

which are usually but not always flattened in the same plane as the pod. Cotyledons plane or nearly so, in the larger diameter of the seeds. enclosed between thick layers of albumen. — Flow. March to April.

N. d. Rosetta in gardens and spontaneous.

In the Tropics of the Old and New World.

633. (2.) **Cassia Sophora** L. Spec. Plant. I (1753), p. 542. — Boiss. Flor. Or. II, p. 632. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 71 no. 410. — Erect, shrubby, glabrous or nearly so, attaining 90 cm to 1.50 m in height. Leaves inflorescence and flowers similar to those of *C. occidentalis*; the leaflets usually more numerous, varying from 5—9 pairs, often obliquely lanceolate and finely acuminate. Petiole with a small basal gland. Pod 2-valved, thinly coriaceous or chartaceous, turgid or subterete, from 5—12 cm long, 6—10 mm in diameter. Seeds very numerous and closely packed. Embryo as in *C. occidentalis*. — Flow. March to April.

N. d. N. v. Often cultivated and naturalized in the gardens.

Local name: sofeyr.

An Indian plant, extending to Australia.

634. (3.) **Cassia bicapsularis** L. Spec. Plant. I (1753), p. 538. — DC. Prodrum. II, p. 494. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 71 no. 412. — *Cassia limensis* Lam. Dict. I, p. 673. — *Cassia pendula* Willd. Enum. Hort. Berol., p. 440. — *Cassia crassise-pala* Benth. in Limaea XXII, p. 527. — *Cassia coluteoides* Collad. Hist. Cass., p. 102 tab. 12. — DC. Prodrum. II, p. 495. — A glabrous shrub, with terete green erect branches, attaining 1.20—3 m; leaflets in 3—4 pairs, membranous, the upper one larger, varying from ovate-oblong to lanceolate, finely acuminate, the larger from 5—8 cm in length; petioles 2 mm; common petiole 8—10 cm, channelled, glabrous, with oblong or cylindrical interpetiolar glands; basal gland 0. Stipules linear deciduous. Flowers glabrous, similar to those of *C. occidentalis*. in pedunculate axillary corymbose erect racemes, much shorter than the leaves. Bracts caducous. Pods erect, thinly coriaceous or chartaceous, terete, smooth, glabrous, obtuse, apiculate, 6—8 cm long, about 1 cm in diameter, tardily dehiscent in 2 valves. Seeds horizontal, shining. Embryo as in *C. occidentalis*. — Flow. March.

N. d. Alexandria; Damietta, spontaneous and often naturalized in the gardens.

Also known from Tropical America.

635. (4.) **Cassia obovata** Collad. Hist. Casses (1816), p. 92 tab. 15 fig. A. — Boiss. Flor. Or. II, p. 631. — Aschers.-Schweinf.

Ill. Flor. d'Eg., p. 70 no. 408. — Rich. Tentam. Flor. Abyss. I, p. 249. — *Cassia Senna* L. Spec. Plant., p. 539 (ex parte). — Herbaceous, erect or ascending from a woody perennial stock 30—60 or even 90—120 cm high, glaucous, wholly glabrous or the young extremities finely pruinose-puberulous. Stem pale green, terete or obtusely angular. Leaves 4—10 cm long; leaflets in 3—7 pairs, obovate to oblanceolate-oblong or obovate-elliptical, apex broadly rounded mucronulate, subcoriaceous, subsessile, 1—2 cm long; interpetiolar glands rudimentary or 0. Stipules obliquely lanceolate acuminate, spreading or decurved, persistent 3—5 mm long. Racemes erect, axillary, at length usually overtopping the leaves, rather laxly many-flowered. Pedicels 4 mm long. Bracts rotundate-ovate apiculate, 4 mm long; caducous. Sepals rather unequal, very obtuse. Two of the anterior anthers considerably larger. Ovary appressed-tomentose. Pod flat oblong-reniforme, broadly rounded at the extremity and obliquely tipped with the remains of the slender style. 2—4 cm long, 14—20 mm broad; valves thinly coriaceous, glabrous or pulverulent, transversely marked with scarcely prominent anastomosing veins, and longitudinally over the seeds with a single series of rounded crest-like plaits. Seeds compressed, obovate, retuse; cotyledons plane, from end to end of the large diameter of the seed. — Flow. March to April.

N. v. mer. Western bords of the Nile near Aswân, in sandy places, abundantly. — **O.** Siwa; Little Oasis; Farâfra; Dakhel; Great Oasis; everywhere cultivated and spontaneous. — **D. l.** Ez-Za'ferani; Kafr Dâwud; Abu-Ghâlib, in deep sand; Kafr Hakim, cultivated. — **D. a. sept.** El-Abbasîya near Cairo, abundantly; Suez. — **D. a. mer.** Esne; Kom-Ombo; rare; Wady Abu Agag, North of Aswân; Qoseyr; Wady Gadire.

Local name: senâ; senâ-mekky.

Occurs eastward to N. W. India. — This species and *Cassia angustifolia* and *Cassia acutifolia* afford officinal senna.

636. (5.) ***Cassia acutifolia*** Delile Illustr. Flor. d'Eg. (1813), p. 75 tab. 27 fig. 1. — Boiss. Flor. Or. II, p. 632. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 70 no. 409. — Batka Monogr. Senna, tab. 1. — For synonymy see same work. — Shrub or undershrub with pale subterete or obtusely angled erect or ascending branches, occasionally slightly zigzag above, glabrous at least below. Leaves usually 4—5-jugate, common petiole eglandular, puberulous or glabrate; leaflets oval or lanceolate, acute, mucronate, usually more or less distinctly puberulous or at length glabrous, pale or subglaucous at least beneath, subsessile. Stipules subulate, spreading or reflexed, 2—4 mm long. Racemes axillary, erect, rather laxly

many-flowered, usually considerably exceeding the subtending leaf. Bracts membranous, ovate or obovate, caducous. Pedicels at length 4—6 mm. Sepals obtuse, membranous. Two of the anterior anthers much exceeding the rest of the fertile stamens. Pod flat, very broadly oblong, but slightly curved upwards, obliquely stipitate, broadly rounded at the extremity with a minute or obsolete mucro indicating the position of the style on the upper edge; 2—5 cm long, 1—2 cm broad; valves chartaceous, obsoletely or thinly puberulous, faintly transversely veined, unappendaged. Seeds obovate-cuneate, compressed; cotyledons plane, extending the larger diameter of the seed in transverse section. — Flow. March to June.

N. v. Siut. — **D. a. mer.** Aswân; Qoseyr; Wady Tundeba; Wady Gadire; Wady Etit.

Local name: senâ; senâ-sa'idy; lisân-el-'asfûr; generally: senâ-mekky.

Also known from Tropical Africa.

Suborder III. Papilionaceae.

Flowers irregular, rarely subregular; hermaphrodite. Calyx gamosepalous 5-toothed or -lobed, or 2 upper lobes more or less connate, or bilabiate 2 upper lobes opposed to the 3 lower; rarely closed in bud and spathaceous. Corolla papilionaceous, or rarely nearly regular; petals 5 free or adnate below to the staminal tube; posterior (standard) outside in bud, 2 lateral (wings) intermediate, 2 lower inside and usually coherent by their lower margins (keel). Stamens perigynous or subhypogynous nearly always (except *Arachis*) 10, diadelphous monadelphous or free. Ovary of the order. Embryo usually with an inflexed radicle, the cotyledons accumbent. — Herbs, shrubs, or trees, sometimes scandent. Leaves alternate, pinnate or digitate, more rarely 1-foliolate or simple. Inflorescence various.

A very numerous subfamily, widely distributed over the whole surface of the globe, and easily known by the peculiar form and arrangement of the petals, constituting the well-known peaflower called by botanists papilionaceous, comparing it, by a not very intelligible stretch of imagination, to a butterfly.

A. Genisteeae. — Stamens monadelphous, the anthers usually of two kinds. Pod two-valved, not articulated. Erect herbs or shrubs, with simple or digitately trifoliate leaves. Leaflets entire.

I. Tube of stamens slit along the top.

a) Calyx with the four upper teeth more or less connate

6. **Lotononis.**

- b) Calyx deeply five-cleft.
1. Style straight. 7. *Argyrolobium*.
 2. Style abruptly bent near the base.
 - α) Shrubs with leaves 8. *Crotalaria*.
 - β) Leafless shrubs 9. *Retama*.
- II. Tube of stamens not slit along the top . 10. *Lupinus*.
- B. *Trifolieae*. — Stamens 10, diadelphous (monadelphous in *Ononis*); anthers uniform (except in *Ononis*). Pod two-valved not articulated. Erect often annual herbs, with three sessile or stalked toothed leaflets.
- I. Stamens monadelphous; anthers dimorphous 11. *Ononis*.
 - II. Stamens diadelphous; anthers uniform.
 - a) Petals quite free from the staminal column.
 1. Pod usually linear, many-seeded (rarely oblong, few-seeded).
 - α) Pod linear, straight 12. *Trigonella*.
 - β) Pod linear, spirally twisted, mostly prickly 13. *Medicago*.
 2. Pod roundish, 1—2-seeded 14. *Melilotus*.
 - b) Petals adnate to the staminal tube . . 15. *Trifolium*.
- C. *Loteae*. — Stamens diadelphous, rarely monadelphous, the alternate filaments or all dilated at the top, the anthers alike. Wings not plicate. Pod not jointed, indehiscent or bivalved. Cotyledons leafy. — Herbs or shrubs with trefoil, pinnate, or digitate leaves, and entire leaflets.
- I. Pod indehiscent, or at last 2-valved.
 - a) Pod orbicular, circinnate 16. *Hymenocarpus*.
 - b) Pod linear, tortuous 17. *Bonaveria*.
 - II. Pods 2 valved.
 - a) Lower leaflets of the pinnate leaf stipule-like. Keel beaked. Pod wingless . . 18. *Lotus*.
 - b) Lower leaflets of the pinnate leaf stipule-like. Pod 4-winged 19. *Tetragonolobus*.
- D. *Galegeae*. — Stamens diadelphous, rarely monadelphous; filaments filiform at the top. Pod not jointed, indehiscent or bivalved. Cotyledons leafy. — Herbs or shrubs with pinnately 3—∞, usually entire leaflets, rarely simple, the petiole not ending in a tendril.

- I. Pod small, generally 1-seeded, indehiscent.
Glandular-dotted shrubs 20. *Psoralea*.
- II. Pod coriaceous or membranous, 2-valved,
transversely partitioned, ∞ -ovuled . . . 21. *Indigofera*.
- III. Pod linear or terete, coriaceous, 2-valved,
2— ∞ -seeded, not partitioned 22. *Tephrosia*.
- IV. Pod more or less divided lengthwise by
infolding of sutures.
a) Calyx-teeth lanceolate 23. *Astragalus*.
b) Calyx-teeth very short 24. *Sesbania*.
- V. Pod not divided lengthwise, oblong or
linear. Shrubs with sweet roots 25. *Glycyrrhiza*.
- E. *Hedysareae*. — Stamens diadelphous or monadelphous, the stamen corresponding to the standard, free at the base, often connate at the middle with the others; filaments generally filiform to the tip; anthers alike. Wings short, rarely equalling the keel. Pod generally flattened, rarely terete, jointed, joints 1—2-seeded. — Herbs or shrubs with pinnate or rarely simple leaves, entire leaflets, and axillary, racemed or spiked peduncles.
 - I. Stamens diadelphous, 10.
 - a) Filaments dilated upwards.
 - 1. Leaves simple 26. *Scorpiurus*.
 - 2. Leaves digitate, pinnate; joints of the
pods horseshoe-like 27. *Hippocrepis*.
 - 3. Leaves pinnate, joints of the pod
straight 28. *Coronilla*.
 - b) Filaments filiform.
 - 1. Pod compressed laterally.
 - a) Pod exserted the calyx.
 - * Ovary sessile or nearly so.
 - † Pod \pm articulate, seeds ∞ 29. *Hedysarum*.
 - †† Pod not articulate, indehiscent, one-seeded 30. *Onobrychis*.
 - ** Ovary peduncled 31. *Taverniera*.
 - β) Pod enclosed by the calyx . . . 32. *Ebenus*.
 - 2. Pod terete, thickly 33. *Alhagi*.
 - II. Stamens monadelphous, 9 34. *Arachis*.
 - F. *Vicieae*. — Stamens usually diadelphous. Anthers uniform. Pod two-valved, not articulated. Scandent herbs, rarely shrubs with

abruptly pinnate leaves ending in a tendril or bristle. Leaflets entire, or in *Cicer* dentate.

I. Wings free. Style filiform, beardless.

Stigma terminal. Pod inflated 35. *Cicer*.

II. Wings adherent to the keel.

a) Tube of the stamens oblique at the mouth.

1. Ovary with ∞ seeds 36. *Vicia*.

2. Ovary with 2 seeds 37. *Lens*.

b) Tube of the stamens truncate at the mouth.

1. Style slightly twisted; petiole ending in a tendril or awn 38. *Lathyrus*.

2. Style not twisted; petiole cirrhose or horned 39. *Pisum*.

G. *Phaseoleae*. — Stamens diadelphous or nearly monadelphous, anthers versatile, or rarely the alternate ones longer and fixed at the base. Pod not jointed, bivalved. Cotyledons thick, generally rising above the ground during germination. First leaves opposite. — Twinning herbs, rarely erect or shrubs, leaves pinnately trifoliolate, leaflets entire or lobed, generally stipellate.

I. Pod linear, straight, partitioned between seeds. Flowers clustered on axillary peduncles 40. *Vigna*.

II. Pod falcion-shaped, not filled up between seeds. Flowers racemed 41. *Dolichos*.

III. Pod flattened, linear, not partitioned. Flowers not racemed in axils 42. *Rhynchosia*.

272. (6.) *Lotononis* DC.

Calyx turbinate, the four upper teeth often more or less connate. Standard oblong; keel bluntly upcurved; wings much shorter and smaller. Stamens all connate in a tube slit along the top; anthers alternately shorter and versatile, longer and basifixed. Pod linear-oblong or linear, compressed or turgid, many-seeded, continuous within. — Herbs or undershrubs with mostly digitately trifoliolate leaves.

A large genus almost confined to the Cape, one species in Spain.

637. *Lotononis dichotoma* (Del.) Boiss. Flor. Or. II (1872), p. 30. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 60 no. 278. — Sickenberg. Contrib. Flor. d'Eg., p. 214. — *Lotus dichotomus* Del. Ill. Flor. d'Eg., no. 717. — *Leobordea lotoidea* Del. Fragment, tab. I. —

Lotononis *Leobordea* Benth. London Journ. Bot. XI, p. 607. — An annual, plant, 10—20 cm high, woolly; stems slender, prostrate, diffuse, forked. Leaflets cuneate-obovate, obtuse, 4—5 mm long. Flowers minute; keel obtuse, longer than the standard, once and a half as long as the calyx; pod oblong, somewhat clubshaped, 5 mm long, longer than the calyx, 6—10-seeded. — Flow. March to May.

D. i. Sâlihiya; Ismailia. — **D. a. sept.** Abbassiya near Cairo; Merg; deserts near Matariya; Gebel Ataq; Wady Abu Marwa; Wady Khafûra.

Local name: 'usheyb; 'eshêb.

Also known from the other parts of the Orient.

273. (7.) *Argyrolobium* Eckl. and Zeyh.

Calyx deeply bilabiate, two upper teeth free in the Egyptian species, three lower ones more or less connate. Standard suborbicular, wings free, keel slightly upcurved, not rostrate. Filaments usually but not invariably united downwards in a closed tube. Ovary sessile, linear, ∞ -ovulate; style upcurved, glabrous, stigma oblique. Pod linear, flattened, faintly torulose. — Undershrubs or herbs with digitately trifoliate leaves.

A genus of moderate size, with its head-quarters at the Cape, outlying representatives reaching India, Siberia, and Southern Europe.

638. *Argyrolobium uniflorum* Jaub. and Spach in Ann. Scienc. Natur. sér. 2 Vol. XIX (1843), p. 45. — Boiss. Flor. Or. II, p. 32. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 60 no. 279. — Sickenberg. Contrib. Flor. d'Eg., p. 214. — Aschers. Flor. Rhinocol., p. 793 no. 71. — *Cytisus uniflorus* Decsne in Ann. Scienc. Natur. sér. 2 Vol. III, p. 365. — A low shrub. Branches rigid, 10—15 cm long, spreading. Leaflets oblong to oblong-linear, acute. Flowers 4 mm long; pod linear, 6—10-seeded. — Flow. March to April.

M. ma. Mariut; Montaza; Alexandria-West and -East. — **M. p.** Bîr Abu Mezrû'; El-'Arîsh. — **D. i.** Gebel Ekhfên.

Also known from Algeria, Tunisia, Tripolitania, Spain, Southern France and Italy, Arabia Petraea and Syria.

274. (8.) *Crotalaria* Linn.

Calyx with a campanulate tube and five distinct equal or sub-equal teeth. Petals subequal; standard orbicular or ovate with a short claw; keel distinctly suddenly or gradually rostrate, much upcurved. Ovary sessile or stalked, bi- or multi-ovulate; style abruptly bent upwards near the base, bearded along the inner side. Stamens united in a tube slit along the top; anthers dimorphous.

Pod sessile or distinctly stalked, round, oblong, or linear, continuous within, turgid. — Herbs or shrubs with simple or digitately trifoliate leaves. Flowers in racemes sometimes congested, terminal or leaf-opposed or rarely in the axils of the leaves. Bracts and stipules usually minute, setaceous.

A large genus spread throughout the Tropical regions of both hemispheres, with its head-quarters in Tropical Africa. Several species extend to the Cape.

A. Corolla as long as the calyx 1. *C. thebaica*.

B. Corolla twice to thrice as long as the calyx . . 2. *C. aegyptiaca*.

639. (1.) ***Crotalaria thebaica*** DC. Prodröm. II (1824). p. 128. — Boiss. Flor. Or. II, p. 25. — Sickenberg. Contrib. Fl. d'Eg., p. 213. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 60 no. 273. — *Spartium thebaicum* Delile Illustr. Flor. d'Eg., p. 107 tab. 37 fig. 1. — Shrubby, a foot or more high, very diffuse; branches stiff, grey downy, many of the lower ones spinose. Leaves simple, sessile, oblong, coriaceous, undulated, 6—10 mm long, blunt, both sides silky. Racemes few-flowered, terminal and lateral. Calyx 4 mm, the linear teeth exceeding the tube. Corolla pale yellow, scarcely exceeding the calyx. Pod twice the calyx, oblong, pubescent, sessile, 2—3-seeded. — Flow. February to April.

N. v. Dendera; between Kene and Luksor; Aswân, abundantly on stony and sandy ground: Kalabsheh. — **D. l. D. a. sept. D. a. mer.** Rare on sandy and calcareous ground.

Local name: netash (Schweinfurth).

Frequent in the desert localities down the river.

640. (2.) ***Crotalaria aegyptiaca*** Benth. in Hook. London Journ. XI (1843). p. 473. — Boiss. Flor. Or. II, p. 25. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 60 no. 274. — Sickenberg. Contrib. Flor. d'Eg., p. 213. — Shrubby. Branches erect, glabrous or appressed-canescant, at length spinescent. Leaves caducous, small, ovate, canescent. Flowers minute, racemed; pod ovoid, twice to thrice as long as the calyx, glabrous. — Flow. February and March.

N. v. Matariya. — **D. l. D. a. sept. D. a. mer.** Not common on stony ground in the deserts.

Local name: natash; netesh (Schweinfurth).

Also known from Arabia Petraea.

275. (9.) ***Retama*** Boiss.

Calyx spathe-like. Claws of petals adnate to staminal tube. All the stamens connate in a closed tube. Pod inflated, spherical

or ovate, 1-seeded, nearly indehiscent. Seeds not caruncled. — Glabrescent shrubs, with branches like those of an Ephedra, sparingly leafy or leafless.

A small genus of only a few species in the Mediterranean region.

641. **Retama Raetam** Webb Phyt. Canar. II (1836—1850), p. 56. — Boiss. Flor. Or. II, p. 37. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 60 no. 280. — Sickenberg. Contrib. Flor. d'Eg., p. 214. — Ascherson-Schweinf. Primit. Flor. Marmaric., p. 601 no. 72. — Aschers. Flor. Sirbon., p. 812 no. 9. — Aschers. Florul. Rhinocol., p. 793 no. 72. — Spartium Raetam Jaub. and Spach in Ann. Scienc. Natur. sér. 2 Vol. XIX, p. 288 tab. 16 fig. 1. — Genista Raetam Forsk. Flor. aegiarab., p. 214. — Spartium monospermum Viv. Flor. Libyc., p. 39. — Shrubby, 1–3 m high, appressed-puberulent, erect, densely branched. Leaves simple, linear, 5 mm long. Flowers 1 cm long, white 1–5 in subsessile clusters along the twigs. Pods 1 cm long, obliquely ovate, inflated, abruptly acuminate-beaked. — Flow. February to March.

M. ma. Everywhere on the dunes of the Eastern Marmarica; Abusîr, in deep sand; Alexandria-West. — **D. i.** 'Alquâm in deep sandy places; Kafr Dâwud; Beni-Selâma; Abu Roash; Khîr Battaqa near Farshut. — **D. a. sept.** Great petrified forest near Cairo; Wady Dugla; Wady Khafûra; Gebel Ataqa; Wady Gendel; Southern Galala.

Local name: retem behâm (Forsk.); generally: retem.

Also known from Tunisia, Algeria, Morocco, and Arabia Petraea.

var. **Duriaei** Letourn. in Bull. Soc. Bot. XXXVI (1889), p. 94. — Retama Duriaei Webb in Ann. Scienc. Natur. sér. 2 Vol. XX, p. 279. — Boiss. Flor. Or., Supplem. p. 159. — Spartium Duriaei Spach in Ann. Scienc. Natur. sér. 2 Vol. XIX, p. 289 tab. XVI fig. 2. — Erect; flowers white in dense clusters, short-peduncled; dents of the calyx shortly triangular. Pods obovate, abruptly mucronate. — Flow. January to March.

M. ma. Abusîr; Montaza; Mandara. — **M. p.** Rosetta; between Qatiya and Tell-el-faddabr; Bîr Malnuky; Bîr-el-abd. — **D. i.** Gebel Ekhfêu; between Henet-el-rekebah and Wady Khamazeh; Sâlihîya. — **D. a. sept.** Anton-Valley, East-Helwân.

Local name: retem.

Also known from Tunisia, Algeria and Arabia Petraea.

276. (10.) **Lupinus** Linn.

Calyx deeply 2-lipped, upper lip entire or emarginate in our species, lower slightly 3-toothed. Standard ovate, wings large, oblong, including the small upcurved rostrate keel. Stamens united in a

close tube. Anthers dimorphous. Ovary sessile, ∞ -ovulate; style slender, upcurved, glabrous; stigma capitate ciliate. Legume compressed, silky, septate between the seeds, 2-valved.

A large genus, almost entirely American. A few annual species with digitate leaves inhabit the shores of the Mediterranean, of which one extends into Tropical Africa.

A. Seeds rough tubersled 1. **L. digitatus**.

B. Seeds smooth.

I. Leaflets linear-spathulate 2. **L. angustifolius**.

II. Leaflets obovate-oblong 3. **L. Termis**.

642. (1.) **Lupinus digitatus** Forsk. Flor. aeg.-arab. (1775), p. 131. — Boiss. Flor. Or. II, p. 27. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 60 no. 275. — Sickenberg. Contrib. Flor. d'Eg., p. 214. — Ic. Visian. Plant. Aeg., tab. 5. — *Lupinus Forskålei* Boiss. Diagn. Plant. Orient. Ser. I fasc. IX, p. 10. — *Lupinus Cosentini* Guss. Prodrum. Flor. Sicul., p. 398. — An annual plant, 50 cm or more high, hispid. Leaflets obovate to linear. Raceme remotely whorled; bracts, linear, soon deciduous; pedicels scarcely shorter than calyx; keel curved beneath at an obtuse right angle; pod 2 cm broad, very hirsute, 3—4-seeded. — Flow. January to March.

N. d. N. f. N. v. Everywhere as a weed in fields.

Local name: tirmis-esh-sheyân.

Only known from Egypt.

643. (2.) **Lupinus angustifolius** L. Spec. Plant. I (1753), p. 1015. — Boiss. Flor. Or. II, p. 28. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 60 no. 276. — Sickenberg. Contrib. Flor. d'Eg., p. 214. — An annual herb, 30—40 cm high, appressed-pubescent. Leaflets linear-spathulate. Raceme rather dense; flowers short-pedicelled, alternate; bracts lanceolate, deciduous; lower lip of calyx 2—3-denticulate; corolla blue or rose-coloured; pods 6 cm long, 8 mm broad, 3—6-seeded; seeds ovate, grey, mottled with white spots and irregular yellowish lines. — Flow. March to April.

N. v. Abundantly in fields of *Lupinus Termis*.

Local name: tirmis-esh-sheyân.

Also known from the Mediterranean region.

644. (3.) **Lupinus Termis** Forsk. Flor. aeg.-arab. (1775), p. 131. — Boiss. Flor. Or. II, p. 29. — DC. Prodrum. II, p. 407. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 60 no. 277. — Sickenberg. Contrib. Flor. d'Eg., p. 214. — Stem 24—60 cm high, not much branched, erect, silky. Petioles $2\frac{1}{2}$ —4 cm long, slender, erect. Leaves digitate, with 5—7 sessile oblanceolate leaflets about 2 cm long, 3—8 mm

broad, the under side silky. Flowers in lax 4—12-flowered sessile racemes. Calyx silky, campanulate, 6—8 mm deep, teeth reaching halfway down. Corolla more than twice as long as the calyx; the standard blue round the border, white within, the wings white, the keel white with a dark blue spot. Pod 6 cm long, 5—6 mm thick, mucronate, thinly silky. — Flow. March.

M. ma. M. p. N. d. N. f. N. v. Cultivated and naturalized everywhere.

Local name: tirmis.

Also known from Tripolitania, Southern Europe and Syria.

277. (11.) **Ononis** Linn.

Herbs or low undershrubs, with pinnately trifoliolate, or rarely simple leaves; the leaflets generally toothed; the stipules leafy, adhering to the leafstalk; the flowers solitary, on axillary peduncles, often forming terminal leafy racemes. Calyx with 5 narrow segments. Standard large and striate. Keel terminating in a pointed beak. Stamens all united in a sheath. Pod inflated, with few seeds.

A rather numerous genus, chiefly from the Mediterranean region. The toothed leaves are like those of the *Trifolium* group, whilst the stamens are monadelphous, as in *Genista* and its allies.

A. Perennials.

I. Leaves linear. 1. **O. Natrix.**

II. Leaves obovate. 2. **O. vaginalis.**

B. Annuals.

I. Pods pendulous from an erect, not jointed peduncle.

a) Corolla purple, as long as the calyx . . 3. **O. reclinata.**

b) Corolla yellow, longer than the calyx . . 4. **O. pubescens.**

II. Pods pendulous, from spreading or erect jointed

peduncles 5. **O. sicula.**

III. Pod erect, as also the short, not jointed peduncle.

a) 20—30 cm high; stems decumbent or

prostrate 6. **O. serrata.**

b) 50—60 cm high; stems erect 7. **O. mitissima.**

645. (1.) **Ononis Natrix** L. Spec. Plant. I (1753), p. 1008. — var. **stenophylla** Boiss. Flor. Or. II (1872), p. 59. — Aschers.-Schweinf. Supplem. Ill. Fl. d'Eg., p. 759 no. 1276. — A perennial herb, 80—100 cm high, or more, glandular-hirsute, viscid or green or canescent. Leaves pinnate with 2 pairs of leaflets, trefoil, or simple, leaflets obovate, striate; leaves and stipules crowded on the short branches; peduncles long, 1-flowered, often aristate; calyx-lobes many times as long as the tube, linear-lanceolate; corolla 10 mm

long, twice as long as the calyx, yellow, the standard often stripped with red; pods linear, 2 cm long, 3 mm broad, loosely hirsute, about twice as long as the calyx; seeds 6—9, tubercled. — Flow. February to March.

M. p. El-Arîsh; sandy places in the environs of El-Grady.

Also known from the other parts of the Mediterranean region.

645a. (2.) **Ononis vaginalis** Vahl Symb. I (1791), p. 53. — Boiss. Flor. Or. II, p. 59. — Aschers.-Schweinf. Illustr. Flor. d'Eg., p. 61 no. 281. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 601 no. 74. — Sickenberg. Contrib. Flor. d'Eg., p. 214. — Ic. Vent. Cels., tab. 32. — Viv. Flor. Libyc., p. 4 fig. 4. — *Ononis Kotschyana* Fenzl. Pug. Illustr. Syr., p. 15. — *Ononis vestita* Viv. Flor. Libyc., tab. 18 fig. 1. — Tomentose-canescens, viscidulous, shrubby at the base; branches short, adscendent often leafless. Leaves sessile or nearly so; leaflets 3—1, minute, thick, obovate, deeply dentate. Flowers, shortly racemosed; peduncles one-flowered thrice as long as the leave; corolla yellow twice as long as the calyx; pod villous, linear thrice as long as the calyx; seeds 6—8. — Flow. February to March.

M. ma. Marmarica: Matruqa; Ras-el-Kena'is; Mariut; Montaza; Alexandria-West and -East; Mandara; Abukir.

Also known from the Canaries and Arabia Petraea.

646. (3.) **Ononis reclinata** L. Spec. Plant. I (1753), p. 1011. — var. **minor** Moris Flor. Sard. (1837), p. 422. — Boiss. Flor. Or. II, p. 61. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 61 no. 283. — Sickenberg. Contrib. Flor. d'Eg., p. 214. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 601 no. 75. — Aschers. Flor. Rhinocol., p. 793 no. 74. — *Ononis mollis* Savi Mem. della Soc. Ital. IX, p. 351 tab. 8. — *Ononis Cherleri* Desf. Flor. Atlant. II, p. 148 not L. — Stems herbaceous, slender, 8—16 cm long, copiously and diffusely branched, the whole plant viscous. Leaflets 3, obovate-cuneate, apex inciso-crenate, central one stalked. Stipules adnate, half-sagittate. Flowers copious, axillary, solitary. Calyx 2—6 mm deep, teeth narrow-linear, reaching down nearly to the base. Corolla between pink and purple, like the oblong turgid pod about equalling the calyx. — Flow. March to April.

M. ma. Marmarica; Alexandria-West and -East. — **M. p.** El-Arîsh. — **N. d.** Damanhur; Mansura; Zaqaziq; Qalyub; Environs of Cairo. — **D. i.** Sâlihiya. — **D. a. sept.** Wady Ansary; Wady Dugla; Esne; Aswân.

Local name: hottebya (Ascherson).

Also known from all the other parts of the Mediterranean region

647. (4.) **Ononis pubescens** L. Mant. (1762), p. 267. — Boiss. Flor. Or. II, p. 62. — Delile Ill. Fl. d'Eg., p. 69. — Aschers.-Schweinf.

Ill. Flor. d'Eg., p. 61 no. 284. — *Ononis calycina* Lam. Dict. I, p. 506. — *Ononis arthropodia* Brot. Phyt., tab. 58. — An annual plant 30—40 cm high, loosely villous and stipitate-glandular; stem rather stout, with corymbose branches. Leaves rather long-petioled, the lower and higher ones simple, the others trefoil with large, obovate to elliptical, denticulate leaflets. Racemes terminal, short, dense; peduncles 1-flowered, nearly as long as the calyx; calyx parted nearly to the base into oblong-lanceolate, 5-nerved lobes; corolla pale yellow, 1,2 cm long, somewhat longer than the calyx; pod ovate-rhomboid, 1 the long, somewhat flattened, shorter than the calyx; seeds 2—3. — Flow. February to March.

D. i. Without exact locality collected by Savigny.

Also known from Arabia Petraea.

648. (5.) ***Ononis sicula*** Guss. Adnot. Catal. hort. Boccard. (1821), p. 10. — Boiss. Flor. Or. II, p. 60. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 61 no. 282. — Sickenberg. Contrib. Flor. d'Eg., p. 214. — *Ononis persica* Burm. Ind., tab. 49 fig. 1. — An annual plant, 10 to 20 cm high, hispid and glandular-pubescent, paniculate-branched from the base. Lowest leaves simple, the others trefoil, with oblong to linear, sharply serrate leaflets. Peduncles 1-flowered, long-aristate, nearly as long as the leaves; calyx-lobes lanceolate-subulate, four times as long as the tube, longer than the pale yellow, 6 mm long corolla; pod hairy, cylindrical 1 cm long, twice as long as the calyx; seeds 20—26, rough. — Flow. March to April.

M. ma. Abusir; Mariut; Alexandria-West and -East; Mandara, in deep sandy places.

Also known from Morocco, Algeria, Tunisia, Tripolitania, Southern Spain and Italy, Syria, Persia and India.

649. (6.) ***Ononis serrata*** Forsk. Flor. aeg.-arab. (1775), p. 130. — Boiss. Flor. Or. II, p. 63. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 602 no. 76. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 61 no. 285. — Aschers. Flor. Sirb., p. 812 no. 10. — Sickenberg. Contrib. Flor. d'Eg., p. 214. — Aschers. Flor. Rhinocol., p. 793 no. 75. — Aschers.-Schweinf. Ill. Flor. d'Eg. Supplem., p. 753. — An annual herb, 20—30 cm high, pubescent-viscid; stems decumbent or prostrate. Leaves rather long-petioled, the lower and middle trefoil, the floral simple, the leaflets oblong to oblong-linear, acutely serrate. Racemes terminal, dense, becoming loose; peduncles short or 0; calyx-lobes lanceolate-subulate, 3—4-times as long as the tube, a little shorter than the corolla; pod ovate, 4—5 mm long, hardly as long as the calyx; seeds 3—5, tubercled-scabrous. — Flow. March to April.

M. ma. In deep sand along the coast from the Marmarica to Abukir. — **M. p.** El-'Arish. — **D. i.** Es-Sâlihiya; Ismailia; Ramses-Station. — **D. a. sept.** Suez, abundantly in deep sand; Belbeys.

Local name: zeyta (Ascherson); zuyyeyta; ziyyeyta.

Also known from Morocco, Algeria, Tunisia, Tripolitania, Arabia Petraea, Syria, Asia Minor and Persia.

650. (7.) **Ononis mitissima** L. Spec. Plant. I (1753), p. 1007. — Boiss. Flor. Or. II, p. 64. — Dill. Ic. Elth., tab. 24 fig. 27. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 61 no. 286. — Sickenberg. Contrib. Flor. d'Eg., p. 214. — An annual herb, 40—50 cm high, stems erect, branching, sparsely crisp-puberulent. Leaves short-petioled, glabrescent, shining, the lower trefoil, the upper simple, leaflets elliptical, cuneate at base, striate, sharply denticulate. Flowers short-peduncled, forming 2—3 cm long, dense, terminal, oblong spikes, leafy at the base, bracteate with leafless, inflated, rose-coloured, scarious, imbricated stipules, covering the calyx-tubes; calyx-lobes lanceolate, spiny-tipped, ciliate, as long as the tube, somewhat shorter than the corolla; pods ovate, 5 mm long, nearly as long as the calyx; seeds 2—3, tubercled. — Flow. March to April.

M. ma. Alexandria. — **N. d. N. f.** Common on way-sides. — **O.** Little Oasis.

Also known the other parts of the Mediterranean region and the Orient.

278. (12.) **Trigonella** Linn.

Herbs, with leaves pinnately trifoliate: the leaflets usually toothed; the leafy stipules adhering to the leafstalks, the flowers axillary, solitary or in heads, spikes, or short racemes. Calyx 5-toothed. Keel obtuse. Stamens diadelphous, the upper one entirely free. Pod protruding from the calyx, several-seeded, either thick and narrow or elongated, or in some species flat and broad, straight or slightly curved.

The genus is widely spread over southern Europe, Asia, and the Mediterranean region, with one Australian species.

A. Pods oblong, linear or lanceolate, terete or compressed.

I. Pods erect or spreading.

a) Flowers sessile, axillary, solitary or twin, yellowish-white or bluish; pods long, terete, long beaked, with anastomosing nerves.

1. Flowers solitary **1. T. Aschersoniana.**

- 2. Flowers 1—2 together 2. *T. Foenum graecum*.
- 3. Flowers 3—4 together 3. *T. occulta*.
- b) Flowers in umbels, heads, or short racemes, 4—8 mm long, (ours yellow). Pods linear, terete or flattened, reticulate, with a suture on both edges 4. *T. monspeliaca*.
- II. Pods deflexed, sometimes ascending, then spreading.
 - a) Pods cylindrical, tapering at the tip; sutures indistinct 5. *T. cylindracea*.
 - b) Pods linear to linear-oblong, more or less flattened, short beaked.
 - 1. Flowers racemed-capitate.
 - α) Flowers 3—5 together 6. *T. media*.
 - β) Flowers 6—18 together.
 - * Leaflets obovate-cuneate 7. *T. hamosa*.
 - ** Leaflets obtriangulate 8. *T. laciniata*.
 - 2. Flowers umbelled-capitate.
 - α) Pubescent 9. *T. maritima*.
 - β) Glabrous.
 - * Corolla 4-times longer than the calyx 10. *T. stellata*.
 - ** Corolla 3-times longer than the calyx 11. *T. anguina*.
 - c) Pods capitate, flattened, one-seeded, with or without a hooked beak 12. *T. arabica*.

651. (1.) **Trigonella Aschersoniana** Urban in Sitzbericht. Bot. Ver. Prov. Brandbg. XXIII (1881), p. 67. — Boiss. Flor. Or. Supplem., p. 162. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 61 no. 294. — Sickenberg. Contrib. Flor. d'Eg., p. 214. — An annual herb, 5—10 cm high; stems prostrate; stipules ovate-lanceolate with 2—5 linear-subulate teeth; leaflets triangular-semiorbicular, two-toothed, retuse, mucronulate; peduncles one-flowered, twice as long as the petiole; calyx-teeth triangular half as long as the hairy tube; standard twice as long as the calyx; ovary linear, stipitate, biovulate buried under ground after flowering time. — Flow. March to April.

M. ma. Mariut.

Also known from Cyrenaica, Cyprus and Cilicia.

652. (2.) **Trigonella Foenum graecum** L. Spec. Plant. I (1753), p. 1095. — Boiss. Flor. Or. II, p. 70. — Rehbch. Ic. XXII, tab. 57 fig. I—II. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 61 no. 287. — Sickenberg. Contrib. Flor. d'Eg., p. 214. — An annual plant, 20 to

50 cm high, sparingly pubescent, erect. Leaflets obovate, to oblong, dentate toward the tip. Flowers solitary, rarely twin, yellowish-white; pods linear, terete or somewhat flattened, slightly curved or straight, 8—15 cm long, 4 mm thick, tapering into a beak one-third their length; seeds 10—20. — Perhaps escaped from cultivation. The sweet smelling seeds are used to give savour to hay that has become musty. — Flow. March.

N. d. N. f. N. v. O. Everywhere cultivated as a forage plant and spontaneous.

Local name: helba.

Also known from all the other parts of the Mediterranean region and the Orient to Persia.

653. (3.) **Trigonella occulta** Del. Illustr. Flor. d'Eg. (1813), p. 101. — Boiss. Flor. Or. II, p. 84. — DC. Prodrum. II, p. 185. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 61 no. 292. — Sickenberg. Contrib. Flor. d'Eg., p. 215. — *Trigonella arguta* Vis. Plant. Aeg., p. 33 tab. 8 fig. 1. — A very diffuse finely silky annual with stems 15—25 cm high. Stipules deeply lacinated from the apex. Leaflets oblanceolate, deeply serrated, 2—6 mm long. Flowers 2—4 in sessile axillary clusters. Calyx 5 mm deep, the linear-setaceous teeth shorter than the tube. Corolla yellow, half as long again as the calyx. Pod elliptical, scarcely exserted, glabrous, transversely reticulated with raised veins, usually 2-seeded. — Flow. March to April.

N. d. Alexandria; Damanhur; Benha-el-'Assal; Cairo; Khanka. — **N. f.** Medînet-el-Fayûm. — **N. v.** Siut; Akhmîm; Luksor; Esne; Silsile.

Also known from the other parts of the Orient to Persia.

654. (4.) **Trigonella monspeliaca** L. Spec. Plant. I (1753), p. 1095. — Boiss. Flor. Or. II, p. 76. — Rehb. Ic. XXII, tab. 59 fig. I—II. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 61 no. 288. — Sickenberg. Contrib. Flor. d'Eg., p. 215. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 602 no. 77. — An annual plant, 10—40 cm high, appressed-pubescent. Leaflets obovate-cuneate to rhomboid, acutely denticulate above. Peduncle 0; flowers 6—18, densely capitate in axils; pods hairy or glabrescent, linear, 1.5 cm long, 2 mm broad, obtuse, stellate. — Flow. February to March.

M. ma. In sandy places along the coast from Marmarica to Alexandria-West.

Also known from Middle Europe and the whole Mediterranean region to Persia.

655. (5.) **Trigonella cylindracea** Desv. Journ. Bot. III (1814), p. 77. — Aschers. Flor. Rhinocol., p. 794 no. 76. — *Trigonella filipes*

Boiss. Flor. Or. Supplem., p. 162. — *Trigonella plagioneura* Boiss. Diagn. Plant. Orient. Ser. I fas. IX, p. 16. — Annual, 10—20 cm high, appressed-puberulent, stems filiform, erect or procumbent. Leaflets, obovate-cuneate, acutely denticulate above. Peduncle filiform, twice as long as the leaf; flowers 15—20, racemed-capitate, 5 mm long, yellow; pods appressed-puberulent, the seed-bearing portion 1—2-seeded, 4 mm long, 1 mm broad, cylindrical, forming an obtuse angle with the subulate, 8 mm long beak. — Flow. March to April.

M. p. El-'Arish; el-Grady.

Also known from Arabia Petraea.

656. (6.) ***Trigonella media*** Delile Illustr. Flor. d'Eg., p. 71 no. 722 (without description). — Urban in Sitzber. Ver. Prov. Brandbg. XXIII (1881), p. 70. — Boiss. Flor. Or. Supplem., p. 162. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 61 no. 290. — Sickenberg. Contrib. Flor. d'Eg., p. 215. — Sparingly puberulous; stems elongated; stipules toothed; the lower-ones linear-lanceolate, the upper-ones ovate, acuminate. Leaflets obtriangular-obcordate, toothed at the tip; peduncles longer than the leaf; flowers 3—5 in clusters; caly half as long as the corolla with subulate teeth as long as the tube; pods erect, glabrous, oblong-linear, curved, transversely striate. — Flow. March to April.

N. d. Cairo (Delile).

Local name: handaquq.

Only known from Egypt.

var. **amblyodon** Aschers. in Sickenberg. Contrib. Flor. d'Eg. (1895), p. 215. — Stipules broad, subtoothed. — Flow. April.

N. d. Cairo; Island of Roda; Deyr-et-tin.

Only known from this locality.

var. **Delilei** Sickenberger in Sickenberg. Contrib. Flor. d'Eg., (1895), p. 215. — Stipules deeply toothed, pinnatisect. — Flow. March to April.

N. d. Island of Roda.

Only known from this locality.

657. (7.) ***Trigonella hamosa*** L. Spec. Plant. I (1753), p. 1094. — Boiss. Flor. Or. II, p. 84. — DC. Prodrum. II, p. 183. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 61 no. 289. — Sickenberg. Contrib. Flor. d'Eg., p. 215. — *Trigonella striata* Visian. Plant. Aeg. Decad. not Lim. — *Trigonella glabra* Thunbg. Flor. Cap., p. 160. — Stems annual, herbaceous, 30 cm or more long, diffusely branched, glabrous. Petioles 6—8 mm long. Leaflets obovate-cuneate, 1 cm long, truncate or

emarginate, the upper half inciso-crenate, terminal one on a stalk 2—4 mm long. Flowers in copious short axillary racemes of 6—12 flowers each. Peduncles 1 cm, ending in a weak spine at the apex. Pedicels under 2 mm long. Calyx 1 mm long, teeth very short. Corolla pale yellow, three or four times as long as the calyx. Pod linear-falcate, 5—8 mm long, prominently reticulato-rugose, about 4-seeded. — Flow. March to April.

M. p. N. d. N. f. N. v. O. Everywhere as a weed in fields and in deep sandy places.

Local name: 'usheb-el-melek (Forsk.); daraqraq; hendaquq; kuteyhah; shandakûk.

Also known from Tropical Africa and the Cape.

var. **indurata** Sickenberger in Sickenberg. Contrib. Flor. d'Eg. (1895), p. 215. — Procumbent, lignose-indurate. — Flow. March.

N. v. Redisiyeh.

Only known from this locality.

658. (8.) **Trigonella laciniata** L. Spec. Plant. I (1753), p. 1095. — Boiss. Flor. Or. II, p. 84. — DC. Prodrum. II, p. 184. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 61 no. 291. — Sickenberg. Contrib. Flor. d'Eg., p. 215 (incl. var. *arguta* and *pedunculata*!). — A diffuse glabrous annual with stems 30 cm or more long. Stipules laciniate from the apex. Leaflets obovate-cuneate, deeply serrated, 8—20 mm long. Flowers 12—20 cm congested axillary racemes on peduncles 6 to 30 mm long. Calyx 3—4 mm deep, teeth setaceous, equalling the tube. Corolla bright yellow, nearly twice the calyx. Pod linear-oblong, straight, glabrous, transversely reticulated with raised lines, 5—6-seeded. — Flow. March to April.

M. ma. N. d. N. f. N. v. O. D. l. D. i. D. a. sept. D. a. mer. Everywhere abundantly.

Local name: deraq (Schweinfurth).

Also known from Tropical Africa.

var. **bicolor** Schweinf. in Aschers.-Schweinf. Ill. Flor. d'Eg. Supplem. (1889), p. 753. — Standard slightly reddish-brown at the tip. — Flow. March to April.

N. f. Medinet-el-Fayûm. — N. v. Beni Suêf; Siut.

Only known from Egypt.

659. (9.) **Trigonella maritima** Delile ap. Poir. Encyclop. Supplem. V (1817), p. 361. — Illustr. Flor. d'Eg., tab. 64 fig. 6. — Boiss. Flor. Or. II, p. 85. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 61 no. 293. — Sickenberg. Contrib. Flor. d'Eg., p. 215. — Aschers.-

Schweinf. Primit. Flor. Marmaric., p. 662 no. 78. — Aschers.-Schweinf. Ill. Flor. d'Eg. Supplem., p. 753. — *Trigonella dura* Vis. Plant. Aeg., p. 32 tab. VII fig. I. — *Trigonella petiolaris* Viv. Flor. Libyc., p. 49 tab. 18 fig. 5. — An annual herb, 10—40 cm high or more, sparingly pubescent or glabrescent, diffuse. Leaflets cuneate-obovate or obcordate, obtusely denticulate. Peduncles shorter than the leaf; flowers 5 mm long; pod very strongly deflexed, curved 1—3 cm long, 2—3 mm broad, tapering-acute at the tip, very obliquely reticulate. — Flow. March to April.

M. ma. Marmarica: Matruqa; Mariut; Alexandria-West and -East; Abukir. — **M. p.** Rosetta; Brullus.

Local name: qort (Aschers.); nifl (Aschers.).

Also known from Arabia Petraea and the Orient.

660. (10.) **Trigonella stellata** Forsk. Flor. aeg.-arab. (1775), p. 140. — Boiss. Flor. Or. II, p. 85. — Delile Ill. Flor. d'Eg., tab. 64 fig. 5. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 61 no. 295. — Aschers.-Schweinf. Prim. Flor. Marmaric., p. 602 no. 79. — Aschers. Flor. Rhinocol., p. 794 no. 77. — Aschers.-Schweinf. Illustr. Flor. d'Eg. Supplem., p. 753. — Sickenberg. Contrib. Flor. d'Eg., p. 215 (incl. var. *dura* Nis!). — An annual herb, 5—35 cm high or more, glabrescent, prostrate, diffuse. Leaves long-petioled, leaflets cuneate-obovate to cuneate-orbicular, truncate or retuse, denticulate. Flowers nearly sessile in the axils, 4 mm long; pods stellate-spreading or deflexed, 1 cm long, 1 cm thick, obliquely netted. — Flow. March to April.

M. ma. M. p. D. i. D. a. sept. D. a. mer. Everywhere abundantly in deep sand. — This species has a smell of Cumarine, more prominent than the other species.

Local name: gargas (Forsk.); zeraqraq (Wilkinson); hendaqûq; tursheyqa.

Also known from the Canaries to Arabia Petraea and Palestine.

661. (11.) **Trigonella anguina** Delile Illustr. Flor. d'Eg. (1813), p. 111 tab. 38 fig. 2. — Boiss. Flor. Or. II, p. 86. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 61 no. 296. — Sickenberg. Contrib. Flor. d'Eg., p. 215. — An annual herb, 10—40 cm high or more, glabrous or glabrescent, prostrate, diffuse. Leaves long petioled, leaflets cuneate-obovate to oblanceolate, truncate or retuse, denticulate. Flowers nearly sessile in the axils, 8 mm long; pods stellate-spreading or deflexed, obliquely netted. — Flow. March to April.

N. d. Cairo, margin of deserts. — **N. f. N. v.** In sandy places, not common. — **D. l.** Wadyên near Thebes.

Also known from Morocco, Algeria, Tunisia, Mesopotamia and Persia.

662. (12.) **Trigonella arabica** Del. in Laborde Plant. Arab. Petr. (1833), p. 86 fig. 5. — Boiss. Flor. Or. II, p. 90. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 62 no. 297. — Aschers. Flor. Rhinocol., p. 796 no. 78. — Sickenberg. Contrib. Flor. d'Eg., p. 216. — *Pocockia arabica* Boiss. Diagnos. Plant. Orient. Ser. 1 fasc. IX, p. 13. — *Trigonella pecten* Schenk Plant. aeg. Spec., p. 37. — An annual herb, 50—60 cm high, nearly glabrous; stems ascending, branched. Leaflets cuneate-obcordate, coarse-toothed or repand at the apex. Peduncles somewhat longer than leaves, umbels 3—8-flowered; corolla pale yellow, 1 cm long; pods glabrous, oblong, falcate, 1.5—3 cm long, 8 mm broad, both sutures spiny-ciliate. — Flow. February to March.

M. p. D. i. Qatiya to el-Arish; El-Grādy.

Local name: uddeyna (Ascherson).

Also known from Arabia Petraea.

Bastards.

662 a. **Trigonella Sickenbergeriana** Muschler hybrid. nov. (650 × 648. — Sickenberg. Contrib. Flor. d'Eg., p. 216. — *Trigonella laciniata* × *media*). — An annual herb, 30—40 cm high, sparingly puberulous, prostrate. Leaflets obtriangular-oblong, serrate at the tip; peduncles somewhat longer than the leaf; heads spherical; pods oblong. — Flow. March.

N. v. Island of Roda; Der-et-Tin.

Only known from this locality.

662 b. **Trigonella Schweinfurthiana** Muschler hybrid. nov. (649 × 648. — Sickenberg. Contrib. Flor. d'Eg., p. 216. — *Trigonella hamosa* × *media*). — An annual plant, diffusely branched, glabrous. Leaflets obovate-cordate, peduncles as long as the leaf, ending in a weak spine at the apex. Pods linear-falcate, glabrous, transversely striate. — Flow. March to April.

N. d. N. v. Matariya; Island of Roda.

Only known from Egypt.

279. (13.) **Medicago** Linn.

Herbs (with one shrubby species), with leaves pinnately trifoliate; the leaflets usually toothed; the leafy stipules adhering to the leafstalks; the flowers small or middle-sized, in short spikes or loose heads, on axillary peduncles. Calyx 5-toothed. Keel obtuse. Stamens diadelphous, the upper one entirely free. Pod small, with few seeds, very spirally twisted, or rarely kidney-shaped and (in our species) indehiscent.

A rather numerous genus in the Mediterranean region and a portion of central Asia, with a few species extending as weeds over a great portion of the globe. To determine the annual species it is absolutely necessary to have the fruit, as some cannot be distinguished by any other character.

A. Perennials. Pod flattened, falcate or snail-like with pervalvate centre.

I. Flowers blue or violet, rarely yellow;
leaflets oblong 1. *M. sativa*.

II. Flowers yellow, stipules ovate.

a) Herbaceous. Peduncles as long as
the leaf 2. *M. marina*.

b) Shrubby. Peduncles longer than the
leaf 3. *M. arborea*.

B. Annuals.

I. Pods flattened, coiled with closed centre.

a) Coils membranous with acute, entire
margin 4. *M. orbicularis*.

b) Coils incumbent, crowded, margin thick,
unarmed or armed with tubercles or
prickles with one root.

1. Pod cylindrical, truncate at the
base and tip.

α) Flowers yellow; pods flattened
at each end 5. *M. litoralis*.

β) Flowers orange; grooved on both
sides 6. *M. truncatula*.

2. Pod ovate or globular, convex at
the base and tip.

α) Pods with three rows of short,
crowded tubercles 7. *M. tuberculata*.

β) Pods with scattered, erect, conical-
subulate, hooked prickles . . . 8. *M. rigidula*.

c) Coils loose, incumbent, prickles arising
from two roots, the posterior root from
a nerve concentric to margin.

1. Pod disk-like, flattened.

α) Appressed-puberulent 9. *M. coronata*.

β) Glabrescent or glabrous.

* Stipules lanceolate, deeply
fringed, peduncles 1—2-flowered 10. *M. granatensis*.

** Stipules pinnatifid-dentate,
peduncles 3—6-flowered . . . 11. *M. hispida*.

2. Pod ovate globular.

α) Soft-pubescent 12. *M. minima*.

β) Glabrescent or glabrous.

* Peduncle shorter than the leaf.

† Pod glabrous coils 3—5. 13. *M. arabica*.†† Pod villous, coils 6—8 . 14. *M. ciliaris*.** Peduncles as long as the leaf 15. *M. Aschersoniana*.

II. Pod kidney-shaped, 1-seeded, spirally

curved at the tip 16. *M. lupulina*.

663. (1.) **Medicago sativa** (L.) Döll Rhein. Flor. (1843), p. 802.
 — Urban Monogr. Medicag. in Verhdlg. Bot. Ver. Prov. Brdgbg. XV
 (1873), p. 56. — Boiss. Flor. Or. II, p. 94. — Aschers.-Schweinf. Ill.
 Flor. d'Eg., p. 62 no. 298. — Sickenberg. Contrib. Flor. d'Eg., p. 216.
 — Stems erect from a deep perennial tap-root, glabrous, 5—10 dm.
 high; leaflets cuneate-oblong to oblanceolate, toothed above; flowers
 many in a short raceme, violet: pod spirally coiled, unarmed. —
 Flow. March to April.

M. ma. M. p. N. d. N. f. N. v. O. D. l. D. i. D. a. sept. D. a. mer.
R. Everywhere cultivated and subsontaneous.

Local name: qadab; qabad (Ascherson); generally: bersim hedjâz.

Origin from Asia Minor, Caucasia, Persia and Afghanistan, everywhere
 cultivated and spontaneous in Middle Europe and the Mediterranean region;
 also in South America.

664. (2.) **Medicago marina** L. Spec. Plant. I (1753), p. 1079.
 — Urban Monogr. Medicago in Verhdlg. Bot. Ver. Prov. Brandbg. XV
 (1873), p. 59. — Boiss. Fl. Or. II, p. 96. — Aschers.-Schweinf. Ill.
 Flor. d'Eg., p. 62 no. 299. — Sickenberg. Contrib. Fl. d'Eg., p. 217.
 — Aschers.-Schweinf. Primit. Flor. Marm., p. 602 no. 80. — An
 perennial herb, 20—40 cm high, or more, canescent-woolly, stems
 prostrate or ascending. Stipules nearly entire; leaflets obovate,
 denticulate at the apex. Peduncles 5—12-flowered nearly as long
 as the leaf; flowers yellow. 6 mm long; pod woolly, disk-like or
 cylindrical, truncate at both ends: coils 3 or less, loose; margin
 obtuse, broad, flattish, 1-nerved to the middle, unarmed or remotely
 prickly with short, conical, awl-shaped spines. — Flow. March to April.

M. ma. Marmarica: Matruqa; Abusir; Montaza; Alexandria-West
 and -East; Abukir. — **M. p.** El-'Arish.

Also known from the other parts of the Mediterranean region, except
 Palestine and Arabia Petraea.

665. (3.) **Medicago arborea** L. Spec. Plant. I (1753), p. 1096.
 — Urban Monogr. Medicago in Verhdlg. Bot. Ver. Prov. Brandbg. XV

(1873), p. 53. — Boiss. Flor. Or. II, p. 93. — *Medicago arborescens* Prsl. Flor. Sicul. I, p. XX. — Shrub 1—4 m high, appressed silky-canescens; stipules lanceolate, entire; leaves obovate or obcordate, subdenticulate at the tip; peduncle somewhat longer than the leaf; flowers large, capitate, yellow; pod membranous appressed puberulous or glabrous, reticulate, convolute. — Flow. March to April.

M. ma. Ramle cultivated and subspontaneous.

Everywhere in the Mediterranean region and in Southern Europe.

666. (4.) **Medicago orbicularis** All. Flor. Pedem. I (1785), p. 314. — Urban Monogr. *Medicago* in Verhdlg. Bot. Ver. Prov. Brandbg. XV (1873), p. 60. — Boiss. Flor. Or. II, p. 97. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 62 no. 300. — Sickenberg. Contrib. Flor. d'Eg., p. 217. — An annual, erect herb, 30—50 cm high, or more, glandular-pubescent. Stipules ovate, dentate; leaflets rather large, obovate-oblong to elliptical, acutely denticulate. Peduncles 1—3-flowered, much shorter than the leaves; flowers 4 mm long, orange; pod 1.3—1.5 cm in diameter, of 5—6 coils, spires cup-shaped, concentric, obliquely netted-veined, with entire, acute margins. — Flow. February to April.

M. ma. Abusir; Mariut; Alexandria-West and -East.

Also known from Morocco, Algeria, Tunisia, Middle and Southern Europe, Tripolitania, Caucasia, Asia Minor, Syria, Mesopotamia and Persia.

667. (5.) **Medicago litoralis** Rohde in Loisl. Not. (1810), p. 118. — Moris Flor. Sard. I, p. 439 emend. — Urban Monogr. *Medicago* in Verhdlg. Bot. Ver. Brandbg. XV (1873), p. 69. — Boiss. Flor. Or. II, p. 98. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 62 no. 301. — Sickenberg. Contrib. Flor. d'Eg., p. 217. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 602 no. 81. — Aschers. Flor. Rhinocol., p. 794 no. 80. — *Medicago striata* Bast. in Desv. Journ. Bot. III, p. 19. — *Medicago longiseta* DC. Flor. Franc. V, p. 568. — An annual herb, 20—40 cm high, or more, appressed villous; stipules fringed at the base; leaflets obcordate to obovate, denticulate at the apex. Peduncles 2—4-flowered, flowers medium-sized, orange; pod 6 mm long and broad, cylindrical, flattened at each end, coils 3—5, closely adjacent, surface netted-veined, margin thick, at length flat, with a prominent nerve, beset with 2 rows of rather remote, awl-shaped, hooked prickles. — Flow. March to April.

M. ma. Marmarica: Matruqa; Dakalla; Ras-el-Kana'is; Abusir, in deep sandy places; Montaza; Mariut; Alexandria-West and -East; Mandara; Abukir. — **M. p.** Rosetta; Brullus; Damietta along the coast, in deep sandy places; el-Grady; el-'Arish; abundant. — **N. d.** Alexandria; Damanhur; Mansura; Mehallet-el-Kebir; Tanta; Zagaziq;

Qalyub; Cairo. — **N. f.** Medinet-el-Fayûm, on way-sides; Senûris; Senhur; Tamîa, in deep sandy places. — **O.** Little Oasis; Farâfra; Dakhel; Great Oasis.

Local name: qurt; kerkeysh; nefâl (Ascherson).

Also known from all the other parts of the Mediterranean region.

668. (6.) **Medicago truncatula** Gaertn. De Fruct. et Semin. II (1791), p. 350. — Urban Monogr. *Medicago* in Verhdlg. Bot. Ver. Prov. Brandbg. XV (1873), p. 67. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 62 no. 302. — Sickenberg. Contrib. Flor. d'Eg., p. 217. — Aschers.-Schweinf. Prim. Flor. Marmaric., p. 602 no. 82. — *Medicago tribuloides* Desrouss. ap. Lam. Encycl. III, p. 635. — Boiss. Flor. Or. II, p. 99. — *Medicago truncatula* Hae. Consp. Flor. Graec. I, p. 360. — *Medicago tribuloides* var. *breviaculeata* Moris Flor. Sard., tab. 42. — An annual plant, 20—40 cm high, or more, appressed-villous. Stipules fringed at the base; leaflets wedge-obovate to obcordate. Peduncles 1—2-flowered, shorter than the leaf; flowers rather large, yellow; pod 6—12 mm long and broad, cylindrical, flat at both ends, with 5, thick, appressed coils, and obtusely or acutely keeled margin, grooved on both sides, and closely beset with two rows of conical, erect, divergent, or appressed prickles. — Flow. February to March.

M. ma. Marmarica: Matruqa; Dakalla; Alexandria-West and -East; Montaza. — **O.** Little Oasis; Farâfra; Dakhel; Great Oasis.

Local name: kerkeysh.

Also known from the other parts of the Mediterranean region.

669. (7.) **Medicago tuberculata** Willd. Spec. Plant. III (1800), p. 1410. — Urban Monogr. *Medicago* in Verhdlg. Bot. Ver. Prov. Brandbg. XV (1873), p. 71. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 62 no. 303. — Boiss. Flor. Or. II, p. 99. — Sickenberg. Contrib. Flor. d'Eg., p. 217. — An annual erect plant, 30—40 cm high, pubescent. Stipules dentate; leaflets obovate-cuneate to oblong. Peduncles 2—8-flowered; flowers 8 mm long, orange; pods ovate-cylindrical to globular, 6 mm to 1 cm long, 5—8 mm broad, with 4—6, close coils, the margins 3-nerved, 2-grooved, with three rows of short, crowded tubercles, or short, connivent, hooked prickles. — Flow. February to March.

M. ma. Ramle.

Also known from Southern Europe and the other eastern parts of the Mediterranean region.

670. (8.) **Medicago rigidula** (L.) Desrouss. in Lam. Encycl. III (1789), p. 634. — Urban Monogr. *Medicago* in Verhdlg. Bot. Ver. Prov. Brandbg. XV (1873), p. 68. — Aschers.-Schweinf. Ill. Flor. d'Eg.,

p. 62 no. 304. — Sickenberg. Contrib. Flor. d'Eg., p. 217. — *Medicago* Gerardi Kit. in Willd. Spec. Plant. III, p. 1415. — Boiss. Flor. Or. II, p. 100. — *Medicago* Banofcensis Kit. in Linnaea (1863), p. 615. — An annual herb, 30—40 cm high, or sometimes more pubescent; stipules incised-dentate; leaflets obovate-cuneate to obovate. Peduncles 2—5-flowered; pods glandular-woolly or glabrescent, 8 mm long and broad, with 5—7, thick coils, the margins rounded, beset with scattered, erect, conical-subulate, hooked prickles, with a somewhat grooved base. — Flow. March to April.

N. d. Without precise locality.

Also known from Spain, Southern Europe to Caucasia and Persia.

671. (9.) ***Medicago coronata*** L. Spec. Plant. I (1753), p. 1098. — Urban Monogr. *Medicago* in Verhdlg. Bot. Ver. Prov. Brandbg. XV (1873), p. 76. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 62 no. 305. — Aschers. Flor. Rhinoc., p. 794 no. 80. — Boiss. Flor. Or. II, p. 101. — Sickenberg. Contrib. Flor. d'Eg., p. 217. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 602 no. 83. — *Diplopriion medicaginoides* Viv. Flor. Libyc., p. 48 tab. 19 fig. 2. — An annual plant, 20—40 cm high, appressed-puberulent. Stipules dentate at the base; leaflets obovate, often retuse, apex obtusely denticulate. Peduncles 3—8-flowered, filiform, much longer than the leaf; flowers minute; pod 4 mm broad, hairy or glabrous, coils 2 or less, with concave, netted face, and broad, flat margin, beset on either side with awl-shaped prickles, at right angles with surface of coils, forming a double crown. — Flow. March to April.

M. ma. Marmarica: Matruqa; Alexandria-West. — **M. p.** Gebel Ekhfên.

Also known from the other parts of the Mediterranean region, Syria, Mesopotamia and Persia.

672. (10.) ***Medicago granatensis*** Willd. Enum. Hort. Berol. II (1813), p. 803. — Urban Monogr. *Medicago* in Verhdlg. Bot. Ver. Prov. Brandbg. XV (1873), p. 62. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 62 no. 311. — Sickenberg. Contrib. Flor. d'Eg., p. 217. — An annual plant, 10—30 cm high. Glabrescent. Stipules lanceolate, deeply fringed; leaflets obovate or cuneate, denticulate. Peduncles 1—2-flowered, not longer than the leaf; pod spherical, spires 5—6, veins netted to the margin, margin thin, rounded, prickles at right angles to surface of the coils, grooved only at the base. — Flow. February to March.

N. f. Ebgig (Ascherson).

Also known from Spain and Palestine, introduced to Chili.

673. (11.) **Medicago hispida** (Gaertn.) Urban in Monogr. *Medicago* in Verhandlg. Bot. Ver. Prov. Brandbg. XV (1873), p. 74. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 62 no. 306. — Aschers. Flor. Rhinocol., p. 794 no. 81. — Sickenberg. Contrib. Flor. d'Eg., p. 217. — *Medicago denticulata* Willd. Spec. Plant. III, p. 1415. — Boiss. Flor. Or. II, p. 102. — An annual plant, 20—50 cm high, sometimes more, glabrous or nearly so. Stipules pinnatifid-dentate; leaflets wedge-obovate to obcordate, mucronulate. Peduncles 3—6-flowered, nearly as long as the leaf or shorter; flowers minute; pod glabrous, 8 mm broad, coils 2—4, loose, surface strongly netted-veined, margin obtuse, deeply grooved on each side with two rows of awl-shaped, divergent, hooked prickles. — Flow. February to March.

M. ma. Abusir, in sandy places; Alexandria-West and -East; Mandara; Abukir. — **M. p.** El-Grady. — **N. d.** Damanhur; Mehallet-el-Kebir; Mansura; Tanta; Qalyub; Cairo. — **N. f.** Medinet-el-Fayûm; Tamia; Senhur; Senûris, on way-sides, abundant. — **N. v.** Siut, in fields and on way-sides; Esne; Kene; Aswân, common. — **O.** Little Oasis; Farâfra; Dakhel; Great Oasis.

Local name: uqeyl; derêssa; generally: nefl.

Also known from the other parts of the Mediterranean region.

674. (12.) **Medicago minima** (L.) Bartal. Cat. Piant. Sien. (1776), p. 61. — Urban Monogr. *Medicago* in Verhdlg. Bot. Ver. Prov. Brandbg. XV (1873), p. 78. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 62 no. 308. — Sickenberg. Contrib. Flor. d'Eg., p. 217. — Boiss. Flor. Or. II, p. 103. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 602 no. 84. — An annual plant, 20—30 cm high or more, greyish, soft-pubescent. Stipules entire or somewhat dentate; leaflets obcordate to wedge-obovate. Peduncles 2—6-flowered, somewhat shorter than the leaf or longer; flowers minute; pod puberulent, nearly globular, 5—8 mm broad, including prickles, coils 4—5, loose, margin thin, grooved on both sides, with two rows of densely crowded, awl-shaped, hooked, erect, 2-limbed prickles, longer than breadth of pods. — Flow. March to April.

M. ma. Marmarica: Matruqa; Abusir; Mariut; Alexandria-West and -East.

Also known from the other parts of the Mediterranean region, Southern and Middle Europe and Persia.

675. (13.) **Medicago arabica** (L.) All. Flor. Pedem. I (1785), p. 315. — Urban Monogr. *Medicago* in Verhdlg. Bot. Ver. Prov. Brandbg. XV (1873), p. 73. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 62 no. 307. — Sickenberg. Contrib. Flor. d'Eg., p. 217. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 602 no. 84. — *Medicago maculata*

Willd. Spec. Plant. III, p. 1412. — Boiss. Flor. Or. II, p. 103. — An annual herb, 30—50 cm high, glabrescent. Stipules semiovate to semisagittate, dentate; leaflets often with a black spot; broad-obovate to obcordate. Peduncles 2—3-flowered, shorter than the leaf, flowers minute; pod glabrous, coils 3—5, rather loose, surface slightly and concentrically netted, margin 3-grooved, prickles long, awl-shaped, reflexed, not hooked, half as long as breadth of pod. — Flow. February to March.

M. ma. Alexandria-West and -East.

Also known from the other parts of the Mediterranean region and Western Europe.

676. (14.) **Medicago ciliaris** Willd. Spec. Plant. III (1800), p. 1411. — Urban Monogr. Medicago in Verhdlg. Bot. Ver. Prov. Brandbg. XV (1873), p. 63. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 62 no. 310. — Sickenberg. Contrib. Flor. d'Eg., p. 217. — An annual plant, 30—50 cm high, glabrescent. Stipules incised; leaflets obovate-rhomboid. Peduncles 1—3-flowered, shorter than the leaf, flowers 8 mm long, yellow; pod 12 mm broad, villous, coils 6—8, rather loose, surface netted-nerved, margin thick, flat, with two rows of straight, awl-shaped prickles, appressed to the pod, at right angles to the face of coils or spreading, not hooked. — Flow. March to April.

M. ma. N. d. N. f. O. Common on alluvial soil.

Local name: nefl; khâsag (Schweinfurth); 'esheb; meddâd.

Also known from Southern Europe and Asia Minor.

677. (15.) **Medicago Aschersoniana** Urb. in Monogr. Medicago in Verhdlg. Bot. Ver. Prov. Brandbg. XV (1873), p. 77. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 62 no. 309. — Sickenberg. Contrib. Flor. d'Eg., p. 217. — *Medicago laciniata* β *brachyacantha* Boiss. Flor. Or. II, p. 104. — Aschers. Flor. Rhinoc., p. 794 no. 82. — An annual herb. Glabrous or sparingly hairy, procumbent. Stipules lanceolate, rather obtusely denticulate; leaflets small, cuneate, truncate or retuse. Peduncles 1—2-flowered, scarcely as long as the leaf; flowers minute; pods small, coils 3—4, with 5—7 veins on face, prickles awl-shaped, hooked, grooved. — Flow. March to April.

M. p. El-^cArish. — N. d. N. f. D. l. D. i. D. a. sept. Common on deep sand and often on alluvial soil.

Local name: adreys (Schweinf.).

Also known from East-India, throughout Persia and Arabia to Nubia and the Cape.

678. (16.) **Medicago lupulina** L. Spec. Plant. I (1753), p. 1097. — Urban Monogr. Medicago in Verhdlg. Bot. Ver. Prov. Brandbg. XV

(1873), p. 52. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 62 no. 312. — Sickenberg. Contrib. Flor. d'Eg., p. 217. — Boiss. Flor. Or. II, p. 105. — DC. Prodr. II, p. 172. — Stems biennial herbaceous, 30 cm or more long, procumbent, copiously branched, slightly downy. Stipules 4—8 mm long, toothed, the free part lanceolate acuminate. Leaflets obovate, toothed. Flowers in long-stalked rounded heads. Pedicels short. Calyx subtubular, with lanceolate teeth. Corolla bright yellow, twice the calyx. Pod 1-seeded, reniform, with an incurved point, reticulate, ultimately black. — Flow. March to April.

M. ma. Montaza; Alexandria-West and -East. — **N. d.** Alexandria. — **O.** Little Oasis.

Also known from the other parts of the Mediterranean region, Europe, Caucasias, Persia and India.

280. (14.) *Melilotus* Linn.

Calyx with a campanulate tube and 5 subequal teeth. Corolla caducous, not adhering to the staminal tube; standard obovate-oblong; wings oblong; keel blunt, often shorter than the wings. Stamens diadelphous; filaments not dilated; anthers uniform. Ovary sessile or stipitate. Pod subglobose or ovoid, subindehiscent, 1—2-seeded. — Annuals or biennials with pinnately trifoliolate leaves with toothed leaflets and flowers in stalked racemes.

A moderately small genus, with its head-quarters in the Mediterranean region.

A. Grooves of the pods concentric.

I. Stipules ciliate dentate; pedicels shorter than the calyx tube 1. **M. sulcatus.**

II. Stipules entire; pedicels longer than the calyx tube 2. **M. messanensis.**

B. Grooves of the pods transverse, curved 3. **M. elegans.**

C. Pods netted-wrinkled 4. **M. indicus.**

679. (1.) *Melilotus sulcatus* Desf. Flor. Atlant. II (1798), p. 193. — Boiss. Flor. Or. II, p. 106. — Rehbeh. Ic. XXII, tab. 74. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 62 no. 313. — Supplem. p. 754. — Sickenberg. Contrib. Flor. d'Eg., p. 217. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 602 no. 86. — *Trifolium sulcatum* Viv. Fl. Libye., p. 45. — An annual erect herb, 20—40 cm high. Stipules ciliate-dentate, the uppermost entire; leaflets obovate to wedge-oblong. Pedicels somewhat shorter than the calyx-tube; flowers 3 mm long, yellow; fruiting racemes 2—4 cm long; pods round-obovate, 2.5 mm long, keeled, obtuse, wrinkles nearly touching. — Flow. March to April.

M. ma. Marmarica: Matruqa; Alexandria-West and -East; Montaza. — **N. d.** Fua; Rosetta; Cairo. — **O.** Siwa; Farâfra; Dakhel; Great Oasis.

Local name: nintîq (G. Roth).

Also known from the other parts of the Mediterranean region.

var. **maior** Camb. ex Boiss. Flor. Or. II (1872), p. 106. — Aschers.-Schweinf. Ill. Fl. d'Eg., p. 62 no. 313. — Leaflets broader, more intensely green; fruiting racemes denser. — Flow. March.

M. ma. Alexandria.

Also known from Arabia Petraea.

680. (2.) **Melilotus messanensis** (L.) Desf. Flor. Atlant. II (1798), p. 192. — Boiss. Flor. Or. II, p. 107. — Ic. Flor. Graec., tab. 741. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 62 no. 314. — Supplem. p. 754. — Sickenberg. Contrib. Flor. d'Eg., p. 217. — *Trifolium messanensis* L. Mant., p. 275. — An annual erect herb, 20—40 cm high, or more diffuse, or the central stem erect. Stipules nearly entire; leaflets obovate to wedge-linear. Flowers 4 mm long, yellow; fruiting racemes 1—2 cm long; pod ovate-oblong, tapering at both ends, 5 mm long, upper suture grooved; wrinkles near together. — Flow. March to April.

M. ma. Abusîr; Alexandria-West and -East; Mandara; Abukîr. — **M. p.** Brullus; El-Arish; abundant. — **N. d.** San; Damietta; Damanhur; Mansura; Mehallet-el-Kebîr; Tanta; Zaqaziq; Qalyub; Cairo. — **N. f.** Medinet-el-Fayûm; Senhur; Senuris; Tamia; everywhere on way-sides. — **O.** Siwa; Little Oasis; Farâfra; Dakhel; Great Oasis; not common, on way-sides. — **D. i.** Sâlihiya; Ismailia. — **D. a. sept.** Suez: Ayûn Musa.

Local name: hendaqûq.

Also known from the other parts of the Mediterranean region.

681. (3.) **Melilotus elegans** Salzmann in DC. Prodrôm. II, p. 188. — Boiss. Flor. Or. II, p. 107. — Ic. Mor. Fl. Sard., tab. 57. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 63 no. 315. — Sickenberg. Contrib. Flor. d'Eg., p. 217. — An erect much-branched slender glabrous annual 30—60 cm high. Petioles 24—36 mm. Leaflets obovate-cuneate, 16—19 mm long, finely toothed. Flowers 12—30 cm lax short-stalked axillary racemes. Pedicel scarcely any. Calyx 1 mm deep, the teeth shorter than the tube. Corolla pale yellow, twice the calyx, the standard exceeding the other petals a little. Pod 1 mm long, globose, glabrous, obscurely reticulate-rugose, 1-seeded. — Flow. March to April.

N. d. Alexandria; Abukîr.

Local name: nîfl.

Also known from the other parts of the Mediterranean region.

682. (4.) **Melilotus indicus** L. Spec. Plant. I (1753), p. 1077. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 63 no. 316. — Sickenberg. Contrib. Flor. d'Eg., p. 217. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 602 no. 87. — Aschers. Flor. Rhinocol., p. 794 no. 83. — *Melilotus parviflorus* Desf. Flor. Atl. II, p. 192. — Boiss. Flor. Or. II, p. 108. — Rehbch. Ic. XXII, tab. 76. — An annual erect plant, 20—50 cm high or more. Stipules entire; leaflets obovate to wedge-oblong. Racemes slender, longer than the leaf; flowers 3 mm long, yellow; pod ovate-globular, 15 mm long, obtuse. — Flow. March to April.

M. ma. Marmarica: Matruqa; Alexandria-West and -East not common. — **M. p.** El-Arish. — **N. d. N. f. N. v.** Everywhere in fields and on way-sides. — **O.** Siwah; Little Oasis: Farâfra: Dakhel; Great Oasis. — **D. i.** Sâlihiya; Ismailia. — **D. a. sept.** Suez.

Local name: qurt (Forsk.); raqrâq (Forsk., Delile); nefl (Delile); nîfl (Ascherson); hendaquq murr (Ascherson); generally: hendaquq.

Also known from the other parts of the Mediterranean region, Caucasia Mesopotamia, Persia and India.

281. (15.) **Trifolium** Linn.

Herbs, with stipules adhering to the leafstalks. Leaves pinnately or almost digitately trifoliate; the leaflets often toothed. Flowers red, white or yellow, in close heads. Calyx 5-toothed. Petals narrow, often connected together, and attached to the staminal tube by the claws, and usually remaining round the pod after fading. Stamens diadelphous, the upper one entirely free. Pod enclosed in the calyx, or in the persistent petals, containing from 1—4 seeds, and usually indehiscent.

A very widely spread and numerous genus in the northern hemisphere, both in the New and the Old World, deficient in several tropical regions, but reappearing in southern America and Africa. It is readily distinguished from *Medicago* and *Trigonella* by the pod, from *Melilotus* by the compact heads of flower, and most of the species differ from all allied genera by the petals, either all or the three lower ones only, connected by their claws with the staminal tube.

Sect. I. *Lagopus*. — Throat of the calyx callous, often hairy, closed or surrounded by a ring of hairs. Heads pseudoterminal, rarely axillary; flowers bractless; pod included in the calyx-tube.

- A. Calyx-tube 20-nerved; throat open, hairy.
Upper leaves opposite 1. *T. lappaceum*.
- B. Calyx-tube 10-nerved; throat in fruit open,
hairy or closed, callous.
- I. Leaves all alternate. Heads pseudo-
terminal, peduncled.
- a) Stipules ovate dentate 2. *T. stellatum*.
- b) Stipules narrow, the free portion seta-
ceous 3. *T. angustifolium*.
- c) Stipules membranous the free portion
awl shaped 4. *T. purpureum*.
- II. Upper leaves opposite, forming an invo-
lucre. Heads pseudoterminal, peduncled.
Throat of the calyx closed.
- a) Calyx half as long as the corolla . . 5. *T. alexandrinum*.
- b) Calyx longer than the corolla . . . 6. *T. formosum*.
- c) Calyx one third as long as the corolla 7. *T. dichroanthum*.
- Sect. II. *Galearia*. — Throat of the calyx naked,
2-lipped fruiting-tube inflated, netted-veined.
Heads axillary; flowers bracteolate; pods inclu-
ded in the calyx-tube.
- A. Perennial. Fruiting-calyx globular, helmet-
shaped 8. *T. fragiferum*.
- B. Annuals. Fruiting-calyx globular, villous or
woolly.
- I. Peduncles longer than the leaves . . . 9. *T. resupinatum*.
- II. Peduncles shorter than the leaves . . 10. *T. tomentosum*.
- Sect. III. *Vesicastrum*. — Throat of the calyx naked
10-nerved. Tube after flowering more or less
inflated, lobes equide. Heads pseudoterminal;
flowers bracteolate; pod inflated, long beaked . 11. *T. xerocephalum*.
- Sect. IV. *Trifoliastrum*. — Throat of the calyx
naked, 10-nerved. Heads axillary, rarely pseudo-
terminal; flowers bracteolate, generally pedicelled;
petals persistent, at length scarious; pod mem-
branous 12. *T. nigrescens*.
- Sect. V. *Chronosemium*. — Throat of the calyx naked,
somewhat 2-lipped. Heads axillary; flowers
pedicelled, at length deflexed; petals persistent
scarious; pods stipitate.
- A. Style nearly as long as the pod 13. *T. patens*.
- B. Style much shorter than the pod.
- I. Standard narrowed at the base 14. *T. stenophyllum*.
- II. Standard not narrowed at the base . . 15. *T. procumbens*.

683. (1.) **Trifolium lappaceum** L. Spec. Plant. I (1753), p. 1082. — Boiss. Flor. Or. II, p. 119. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 754. — Ic. Mor. Flor. Sard., tab. 62 fig. 1. — Aschers. Flor. Rhinocol., p. 794 no. 84. — An annual plant, 30–50 cm high, or more, sparingly appressed-hairy; stems erect or diffusely branched. Free portion of stipules lanceolate-subulate; leaflets obovate to oblong-obcordate. Heads globular, generally peduncled; calyx somewhat shorter than the corolla, lobes nearly equal, slightly ciliate, dilated at the base, 5-nerved, setaceous at the tip, more than twice as long as the glabrous tube. — Flow. March to April.

M. ma. Alexandria, probably introduced. — **M. p.** El-^cArish (introduced).

Also known from the other parts of the Mediterranean region.

684. (2.) **Trifolium stellatum** L. Spec. Plant. I (1753), p. 1083. — Boiss. Flor. Or. II, p. 121. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 602 no. 88. — Rehb. Ic. XXII, tab. 92. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 63 no. 317. — An annual plant, 20 to 30 cm high, or more, stems erect or ascending. Stipules ovate, obtuse or acute, dentate; leaflets small, wedge-obovate to obcordate. Heads globular, rather loose; calyx about as long as the pink to white corolla, lobes lanceolate-subulate, somewhat connate at the base, twice as long as the tube, at length stellate-spreading, fruiting-tube at length closed. — Flow. March to April.

M. ma. Nuzza near Alexandria.

Also known from the other parts of the Mediterranean region, Caucasia and Mesopotamia.

685. (3.) **Trifolium angustifolium** L. Spec. Plant. I (1753), p. 1083. — Boiss. Flor. Or. II, p. 122. — Rehb. Ic. XXII, tab. 92 fig. 1. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 63 no. 318. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 602 no. 88. — An annual herb, 30–50 cm high or more; appressed-hirsute. Stipules narrow, the free portion setaceous; leaflets linear. Heads oblong-conical, in fruit oblong, often 8 cm long, 2 cm broad, calyx-lobes subulate, spinescent, the lowest somewhat longer than the other four, shorter than the pink corolla. — Flow. March to April.

M. ma. Marmarica; Ramle, recently introduced (Letourneux).

Also known from Morocco, Algeria, Tunisia, Middle and South Europe, Caucasia, Asia Minor, Syria and Persia.

686. (4.) **Trifolium purpureum** Loisel. Flor. Gall. ed. 2 Vol. II (1828), p. 125 tab. 14. — Boiss. Flor. Or. II, p. 123. — Aschers.-Schweinf. Ill. Flor. d'Eg. Supplem., p. 754. — Aschers. Flor. Rhinocol.,

p. 794 no. 89. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 602 no. 89. — Sickenberg. Contrib. Flor. d'Eg., p. 217. — An annual erect herb, 20—50 cm high, sometimes more, appressed-hairy, erect. Stipules membranous, narrow, the free portion awl-shaped; leaflets linear-lanceolate to elliptical-oblong, obtuse or acute. Heads ovate, in fruit oblong; calyx one-third to one-half as long as the purple corolla, lobes subulate, plumose, truncate at the tip, the lowermost longer than the tube. — Flow. February to March.

M. ma. Marmarica: Matruqa. — **M. p.** El-'Arish; in deep sandy places.

Also known from Southern East-Europe, Palestine, Syria, Mesopotamia and Asia Minor.

687. (5.) **Trifolium alexandrinum** L. Spec. Plant. I (1753), p. 1085. — Boiss. Flor. Or. II, p. 127. — DC. Prodr. II, p. 193. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 63 no. 320. — Sickenberg. Contrib. Flor. d'Eg., p. 217. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 602 no. 89. — Stems glabrous, 30—60 cm high. Stipules 2.5—3 cm or more long, adnate only in the lower third or quarter. Leaflets oblong or oblong-lanceolate, quite glabrous, 2 to 5 cm long. Flowers 20—30, in dense long-stalked finally oblong heads. Bracts setaceous, very minute. Calyx sessile, 1 mm long, finely-silky, the setaceous teeth exceeding the tube. Corolla yellowish, twice the calyx. Pod minute, included in the calyx-tube, 1-seeded. — Flow. March to April.

M. ma. M. p. N. d. N. f. N. v. D. l. D. i. D. a. sept. D. a. mer. O. Cultivated everywhere as a forage plant and subsynchronous.

Local name: berzun (Forskål); generally: bersim.

Only known from Egypt and Cyrenaica; the true home uncertain.

688. (6.) **Trifolium formosum** D'Urv. Eumérat. (1882), p. 94. — Boiss. Flor. Or. II, p. 124. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 63 no. 319. — Sickenberg. Contrib. Flor. d'Eg., p. 217. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 602 no. 90. — An annual plant, 30—50 cm high, hirsute, erect. Stipules membranous, inflated, ovate, with a long lanceolate-subulate tip; leaflets elliptical-oblong, often 6 cm long, 1 cm broad, acute. Heads ovate, 4 cm long, 2 cm broad, in fruit oblong, 5 cm long, 4 cm broad; calyx-lobes lanceolate-subulate, longer than the purple corolla, twice as long as the tube, somewhat spreading in fruit. — Flow. March to April.

M. ma. Marmarica: Matruqa; Umm Rakum: Alexandria-West and -East.

Also known from Southern Europe, Syria, Palestine, Mesopotamia and Persia.

689. (7.) **Trifolium dichroanthum** Boiss. Diagn. Plant. Orient., Ser. 1 fasc. IX (1849) p. 20. — Flor. Or. II. p. 124. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 754. — Aschers. Flor. Rhinocol., p. 794 no. 86. — Sickenberg. Contrib. Flor. d'Eg., p. 217. — An annual herb, 20—40 cm high, sometimes more, appressed-hirsute, procumbent. Stipules short-setaceous-caudate, the upper inflated; leaflets elliptical-linear, obtuse. Flowering heads ovate, 3 cm long, 2 cm broad, the fruiting cylindrical; calyx very hirsute, one-third as long as the particolored purple and white corolla, lobes subulate, nearly equal, longer than the tube; standard pale flesh coloured, much longer than the wings and keel. — Flow. March to April.

M. p. El-'Arish; Maqta' Rûs-es-Subyân; Qabr-'Amir; el-Grâdy.

Also known from Southern Europe, Arabia Petraea and Mesopotamia.

690. (8.) **Trifolium fragiferum** L. Spec. Plant. I (1753), p. 1086. — Boiss. Flor. Or. II. p. 135. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 63 no. 321. — Sickenberg. Contrib. Flor. d'Eg., p. 217. — Ic. Fl. Dan., tab. 1042. — *Trifolium neglectum* Fih. and Mey. Ind. Hort. Petrop. IX, Supplem. p. 21 and in Herb. — *Trifolium congestum* Link in Limaea not Guss. — DC. Prodrum. II, p. 202. — Perennial with caespitose procumbent rooting stems. Stipules semi-adnate with lanceolate points. Leaflets oblong-obovate, sessile. Heads dense, 6—8 mm broad, with bracts which equal the subsessile calyx. Calyx $2\frac{1}{2}$ —4 mm long, with linear teeth, becoming much dilated and membranous. Corolla pale rose, twice the calyx. Pod included, ovoid, 1—2-seeded. — Flow. February to April.

N. d. Alexandria, bords of the Mahmudiye-Canal; rare.

Also known from Southern and Middle Europe, Syria, Palestine, Persia
te India.

691. (9.) **Trifolium resupinatum** L. Spec. Plant. I (1753), p. 1086. — Boiss. Flor. Or. II, p. 137. — Rehbch. Ic. XXII, tab. 107 fig. II. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 63 no. 322. — Sickenberg. Contrib. Flor. d'Eg., p. 217. — Aschers. Flor. Rhinocol., p. 794 no. 87. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 754. — *Trifolium bicornis* Forsk. Flor. aeg.-arab., p. 139. — *Trifolium suaveolens* Willd. Enum. Hort. Berol., tab. 108. — A glabrous annual, with numerous stems, leafy and tufted at the base, lengthened out to a foot or more. Stipules rather broad, with narrow points. Flower-heads small, on short axillary peduncles. Calyx glabrous or hairy on the upper side, the teeth short, but after flowering the upper part becomes very much inflated, arched, membranous and veined, with the 2 upper teeth at the top, the 3 lower ones remaining at the base of the inflated part. Corolla small, pink, the sides of the standard turned

outwards instead of inwards as in other *Trifolia*. — Flow. March to April.

M. ma. Abusîr; Alexandria-West and -East; Mandara; Abukir. — **M. p.** El-^cArîsh. — **N. d.** Alexandria; Damanhur; Mansura; Tanta; Zaqaziq; Cairo. — **N. f.** Senhur; Tamîa; Gharaq. — **N. v.** Siut; Kene; Esne; Aswân. — **O.** Little Oasis; Farâfra; Dakhel; Great Oasis. — **D. i.** Bîr Abû Ballah.

Local name: qort (Schweinf.); lueyna (Ascherson).

Also known from Morocco, Algeria, Tunisia, all the other parts of the Mediterranean region of Europe, Caucasia, Mesopotamia and Persia.

692. (10.) **Trifolium tomentosum** L. Spec. Plant. I (1753), p. 1086. — Boiss. Flor. Or. II, p. 138. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 63 no. 323. — Sickenberg. Contrib. Flor. d'Eg., p. 217. — Aschers. Flor. Rhinocol. p. 794 no. 88. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 602 no. 92. — An annual erect herb, 30—50 cm high, glabrous; stems diffuse. Stipules ovate-lanceolate. Peduncles shorter than the leaves, sometimes 0; heads 5 mm broad in flower, 1—1.5 cm in fruit; flowers nearly sessile; calyx two-thirds as long as the pink corolla, in fruit densely pannous, teeth linear-subulate, hidden by wool, the upper deflexed; pod ovate, compressed. — Flow. March to April.

M. ma. Marmarica; Matruqa; Abusîr; Mariut; Alexandria-West and -East. — **M. p.** El-^cArîsh. — **D. i.** Sâlihîya; Ismailia; Ramses.

Local name: kreyshet-er-raî³; kreysheh (Ascherson).

Also known from all the other parts of the Mediterranean region and Persia.

693. (11.) **Trifolium xerocephalum** Fenzl Pug. (1842), p. 10. — Boiss. Flor. Or. II, p. 140. — Aschers.-Schweinf. Ill. Flor. d'Eg., Suppl. p. 754 no. 1280. — Sickenberg. Contrib. Flor. d'Eg., p. 217. — An annual herb, 15—40 cm high, glabrescent; stems diffuse. Free part of the stipules lanceolate-subulate; leaflets 1 cm long, wedge-obovate to oblong, serrulate, mucronulate. Heads short-peduncled, involucrate at the base, globular, 6—10 mm in diameter, in fruit oblong to oblong-cylindrical, dense; calyx-lobes lanceolate-subulate, tube in fruit pyriform-turbinate, 2—3 mm long, 1 mm broad, about 36-nerved marked by two, villous, longitudinal lines; petals obtuse. — Flow. March to April.

M. ma. Alexandria-West (Blomfield).

Also known from Arabia Petraea.

694. (12.) **Trifolium nigrescens** Viv. Flor. Ital. Fragment., fasc. I (1808) p. 12 tab. 13. — Boiss. Flor. Or. II, p. 143. — Aschers.-

Schweinf. Ill. Flor. d'Eg., p. 63 no. 324. — Sickenberg. Contrib. Flor. d'Eg., p. 217. — An annual herb, 30—50 cm high, or more, glabrous; stems decumbent or ascending, hollow. Stipules ovate, abruptly cuspidate; leaflets obovate, often truncate, denticulate at the apex. Heads nearly globular, 1—1.5 cm in diameter; calyx about half as long as the white corolla, lobes lanceolate-subulate from a broad, three-nerved base, the upper ones nearly as long as the tube; pod linear, straight, longer than calyx-tube, 4-seeded, lower margin crenate. — Flow. February to March.

M. ma. Alexandria-West and -East, not common, recently introduced.

Also known from Arabia Petraea and Mesopotamia and other parts of the Mediterranean region.

695. (13.) **Trifolium patens** Schreb. ap. Sturm. Flor. German. (1851), p. 16. — Boiss. Flor. Or. II, p. 153. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 63 no. 325. — Sickenberg. Contrib. Flor. d'Eg., p. 217. — DC. Prodrum. II, p. 212. — An annual herb, 10—20 cm high, appressed-hirsute, erect. Stipules half-ovate to oblong, acute; leaflets elliptical-oblong, cuneate at base, the lower retuse. Peduncles slender, twice to thrice as long as the leaf. Heads ovate, loose, 3 cm long, 2 cm broad; pedicels somewhat longer than calyx-tube; the upper two calyx-teeth triangular, shorter than the tube, the lower three lanceolate, obtuse, twice as long as the tube; standard obovate-orbicular, violet, much longer than the white wings and keel. — Flow. March to April.

M. ma. Between Dekheyle and Bir Khreyr (Sickenberg.) Ramle, recently introduced (Letourneux).

Also known from Southern Europe.

696. (14.) **Trifolium stenophyllum** Boiss. Diagnos. Plant. Orient., ser. I fasc. IX (1849) p. 30. — Boiss. Flor. Or. II, p. 151. — Aschers. Flor. Rhinocol., p. 794 no. 89. — Sickenberg. Contrib. Flor. d'Eg., p. 217. — An annual erect herb, 10—15 cm high, appressed pubescent hairy; stems ascending from the neck. Stipules triangular-lanceolate, the upper acuminate; leaflets small, obovate to oblong, and linear. Peduncles twice to thrice as long as the leaves; heads ovate, at length oblong, 3 cm long, 1 cm broad; podicels one-third to one-half as long as the calyx-tube; calyx 2-lipped, the upper two teeth short-triangular, the lower one long-linear; corolla pink; standard oblong-spathulate. — Flow. March to April.

M. p. Qabr-'Amîr.

Also known from Arabia Petraea.

697. (15.) **Trifolium procumbens** L. Spec. Plant. I (1753), p. 1088. — Boiss. Flor. Or. II, p. 153. — Ic. Rehbch. XXII, tab. 121 fig. 1. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 63 no. 322a. — Sickenberg. Contrib. Flor. d'Eg., p. 218. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 602 no. 95. — *Trifolium agrarium* Gren. and Godron Flor. Franc. II, p. 423 not L. — A slender annual, much branched at the base, glabrous or slightly downy, procumbent or nearly erect, 12—30 cm long, or rather more. Stipules broad and pointed. Leaflets obovate or obcordate, the central one at some distance from the others. Flower-heads loosely globular or ovoid, on rather long axillary peduncles, containing 30—50 small yellow flowers on very short pedicels; in fading the flowers become reflexed, and turn pale brown, with a broadly obovate standard, distinctly marked with longitudinal furrows, and completely concealing the small, 1-seeded pod. — Flow. February to April.

M. ma. Marmarica: Alexandria-West and -East. — **M. p.** El-'Arish. — **N. v.** Between the pyramids of Giza and Abusir.

Also known from all the other parts of the Mediterranean region, Europe and Persia.

282. (16.) **Hymenocarpus** Sav.

Calyx tubular, deeply and equally 5-fid. Petals free, short-clawed, keel beaked. Stamens diadelphous. Ovary 2-ovuled. Pod stipitate, circinnate, flat, 2-celled by means of a transverse partition, indehiscent, its outer margin broad-winged. — Annual herbs, with aspect of *Medicago*, the lower leaves destitute of stipules.

A small genus in the Mediterranean region.

698. **Hymenocarpus nummularius** (DC.) Boiss. Flor. Or. II (1872), p. 160. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 63 no. 326. — Sickenberg. Contrib. Flor. d'Eg., p. 218. — An annual plant, 30—60 cm high, villous ascending or diffuse. Lower leaves entire, oblong-spathulate, the others sessile, with 2—4 pairs of leaflets, the terminal larger. Heads peduncled, 2—4-flowered; calyx-teeth linear, longer than the tube; pod round, appressed-hairy, wing broader than the cell, with a network of raised veins and a crenate, prickly margin. — Flow. January to March.

M. ma. Mariut; Alexandria-West and -East. — **M. p.** El-'Arish. Also known from Syria, Palestine, Persia and India.

283. (17.) **Bonaveria** Linn.

Calyx short-campanulate, somewhat 2-lipped, upper teeth connected higher up than lower. Keel tapering-beaked. Pod elongated-

linear, beaked, flattened, nearly indehiscent, margin thickened on both sides, space between seeds somewhat constricted, not separating into joints. — Annual herbs, with aspect of *Coronilla*.

A small genus, distributed in the Mediterranean region.

699. **Bonaveria Securidaca** (L.) Desv. Journ. Bot. I (1813), p. 120. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 64. no. 339. — *Securigera Coronilla* DC. Flor. Franc. IV, p. 609. — Boiss. Flor. Or. II, p. 76. — *Coronilla Securidaca* L. Spec. Plant. I, p. 1048. — An annual plant, 40—60 cm high, glabrous, erect or diffuse. Leaflets 5—7 pairs, cuncate, truncate or retuse. Peduncles longer than the leaves, 6—8-flowered, in fruit much elongated; flowers yellow; pods papillary between margins; beak hooked. — Flow. March to April.

M. ma. Ramle, probably recently introduced (Letourneux).

Also known all the other parts of the Mediterranean region and Europe.

284. (18.) **Lotus** Linn.

Calyx with a campanulate tube and five subequal teeth. Corolla caducous, free from the staminal tube; standard unguiculate, wings obovate; keel upcurved rostrate. Stamens diadelphous; alternate filaments dilated; anthers nearly uniform. Ovary sessile ∞ -ovulate; style upcurved; stigma terminal or lateral. Pod linear, straight in our species, turgid, 2-valved, septate between the seeds. — Herbs with usually five leaflets, the lowest pair like stipules.

A large genus, belonging to the North and South temperate zones of both hemispheres.

A. Calyx tubular-campanulate. Pod oblong or linear.

I. Perennials.

a) Flowers yellow.

1. Leaves sessile or shortly petioled.

α) Leaflets lanceolate 1. *L. argenteus*.

β) Leaflets broad-ovate.

\dagger Pod not torulose 2. *L. creticus*.

$\dagger\dagger$ Pod torulose 3. *L. cytisoides*.

2. Leaves long petioled.

α) Peduncles thick 4. *L. corniculatus*.

β) Peduncles slender 5. *L. lamprocarpus*.

b) Flowers pink or purple 6. *L. lanuginosus*.

II. Annuals.

a) Flowers pink, purple or whitish.

1. Flowers peduncled 7. *L. arabeus*.

2. Flowers sessile or nearly so.

- α) Calyx half as long as the corolla 8. *L. glinoides*.
 β) Calyx as long as the corolla 9. *L. Schimper*.
 b) Flowers yellow 10. *L. angustissimus*.
 B. Calyx 2-lipped. Pod linear, cylindrical or flattened.
 I. Peduncles shorter than the leaf . . . 11. *L. peregrinus*.
 II. Peduncles twice to thrice as long as the leaf 12. *L. villosus*.
 III. Peduncles somewhat longer than the leaf 13. *L. ornithopodioides*.
 C. Calyx campanulate. Pod thick, longitudinally 2-celled by inflexion of upper suture 14. *L. edulis*.

700. (1.) **Lotus argenteus** (Del.) Webb Phyt. Can. II (1836 to 1850). p. 87. — Boiss. Flor. Or. II, p. 164. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. (2) 63 no. 327. — Sickenberg. Contrib. Flor. d'Eg., p. 218. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 603 no. 95. — *Lotus creticus* Viv. Flor. Libyc., p. 46 not *L.* — *Doryenium argenteum* Del. Ill. Flor. d'Eg., p. 257 tab. 40 fig. 1. — *Lotus polyphyllus* Clarke in Spr. N. Entd. III, p. 164. — *Lotus polycarpus* Viv. Plant. Aeg. Dec., tab. 2 fig. 9. — Shrubby at the base, sericeous-silvery, stems prostrate with short branches densely foliate. Leaves sessile; leaflets shortly lanceolate acute; peduncles 3—6-flowered as long as the leaf; flowers sessile; calyx as long as the corolla; standard as long as the keel; pod oblong, terete, 2—3-seeded. — Flow. March to April.

M. ma. Marmarica: Matruqa; Ras-el-Kena'is; Montaza; Alexandria-West and East.

Also known from Tripolitania.

701. (2.) **Lotus creticus** L. Spec. Plant. I (1753), p. 1091. — Boiss. Flor. Or. II, p. 164. — Rehbch. fil. Ic. XXII, tab. 134. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 64 no. 328. — Supplem. p. 754. — Sickenberg. Contrib. Flor. d'Eg., p. 218. — Aschers.-Schweinf. Prim. Flor. Marmaric., p. 603 no. 96. — Aschers. Flor. Sirbon., p. 812 no. 11. — DC. Prodrum. II, p. 214. — A diffuse copiously-branched perennial 30—60 cm high, sometimes suffruticose, the branches densely grey-silky. Leaflets 5, rather fleshy, oblanceolate-cuneate, 8—12 mm long, both sides densely grey-silky. Flowers in umbels of 4—8 on axillary peduncles 18—36 mm long. Pedicels very short. Bracts compound, equalling or shorter than the calyx. Calyx 6 mm long, densely grey-silky, the linear teeth equal to the tube. Corolla yellow, twice the calyx. Pod linear, 2—3.5 cm long, turgid, glabrous, 9—15-seeded. — Flow. March to April.

M. ma. Marmarica: Matruqa; Ras-el-Kena'is; Mariut; Alexandria.
— **M. p.** El-Likhleykhe.

Also known from the other parts of the Mediterranean region and Asia Minor.

702. (3.) **Lotus cytisoides** L. Spec. Plant. I (1753), p. 1092. — Boiss. Flor. Or., Supplem. p. 170. — Murbeck Contr. Flor. Nord-Ouest Afrique I, p. 67 tab. 3 fig. 11—12. — *Lotus creticus* var. *cytisoides* Boiss. Flor. Or. II, p. 165. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 64 no. 328. — Sickenberg. Contrib. Flor. d'Eg., p. 218. — *Lotus prostratus* Desf. Flor. Atlant. II, p. 206. — *Lotus secundiflorus* Viv. Flor. Libye., p. 46 tab. 21 fig. 3. — *Lotus Allionii* Desv. Journ. Bot. III, p. 77. — A perennial herb, 20—50 cm high, sometimes more, canescent with appressed hairs, not silky, prostrate or ascending. Leaves sessile or short-petioled, leaflets oblong-obovate. Peduncles 2—5-flowered: pod linear-flattened, 2—4 cm long, torulose; seeds ovate. — Flow. March to April.

M. ma. Alexandria-West and -East rare.

Also known from the other parts of the Mediterranean region, except Morocco.

703. (4.) **Lotus corniculatus** L. Spec. Plant. I (1753), p. 1092. — Boiss. Flor. Or. II, p. 165. — Rehbch Ic. XXII, tab. 129. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 63 no. 329. — Sickenberg. Contrib. Flor. d'Eg., p. 218. — DC. Prodrum. II, p. 211. — Stem 12—40 cm long, diffusely branched, glabrous or thinly silky. Leaflets subsessile, obovate-cuneate, 12—18 mm long, glabrous. Flowers 4—9, in an umbel on a peduncle 2—5 cm long, with a compound bract. Pedicels 2.5 mm long. Calyx 1 cm long, glabrous or slightly silky, the teeth lanceolate-cuspidate, reaching more, than halfway down. Corolla yellow, twice as long as the calyx. Pod 1—2 cm long, 2 mm broad, straight. — Flow. March to April.

M. ma. Abusir, on sandy hills, not common; Alexandria-West and -East; Mandara; Abukir. — **M. p.** Brullus. — **N. d.** Rosetta; Maxama; Damanhur; Mansura; Mehallet-el-Kebir; Tanta; Qalyub; Cairo and environs. — **N. f.** Medinet-el-Fayûm; Senûris; Senhur; Tamia; Gharaf; often in fields as a weed. — **O.** Siwa; Little Oasis. **D. i.** Bir-Abû-Ballah.

Local name: kâteha; zeyta; ka'b-el-ghazal; line.

Also known from Europe, all the other parts of the Mediterranean region and Tropical Africa.

var. **tenuifolius** L. Spec. Plant. I (1753), p. 1092. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 64 no. 329. — Sickenberg. Contrib. Flor.

d'Eg., p. 218. — *Lotus tenuifolius* Rehbch. Flor. germ. exsicc., p. 506. — Boiss. Flor. Or. II, p. 166. — Glabrous or somewhat hirsute, procumbent. Leaves short-petioled, leaflets linear-obovate to linear. Peduncles slender, 1—5-flowered, many times longer than the leaf; calyx-lobes triangular-subulate, nearly equal, almost as long as the tube; standard orbicular, wings oblong-obovate, the lower margin straightish. — Flow. March to April.

M. ma. M. p. N. d. N. f. D. i. Abundant on way-sides.

Also known from Europe (on salt marshes).

704. (5.) ***Lotus lamprocarpus*** Boiss. Diagn. Plant. Orient., Ser. I fasc. IX (1849) p. 33. — Flor. Or. II, p. 166. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 64 no. 330. — Sickenberg. Contrib. Flor. d'Eg., p. 218. — *Lotus palustris* Ledeb. Flor. Ross. I, p. 562 not Willd. — A perennial herb, 60—100 cm high, hispid, grey, diffusely branched. Petioles shorter than the ovate, acutish leaflets. Peduncles slender, twice to thrice as long as leaf, 2—4-flowered; flowers small; calyx-lobes lanceolate-subulate, twice as long as tube, a little shorter than the corolla; standard obovate, wings oblong-linear, keel gradually curved; pods glabrous, shining grey, straight, 2 cm long, 3—4 times as long as the calyx. — Flow. March to April.

M. ma. Alexandria-West. — **O.** Dakhel; Great Oasis.

Also known from Greece to Syria, Arabia Petraea and Transcaucasien.

var. **glaberrimus** Ascherson and Schweinfurth in Sitzber. Ges. naturf. Freunde, Berlin (1879), p. 43. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 64 no. 330. — Sickenberg. Contrib. Flor. d'Eg., p. 218. — Stems and leaves glabrous. — Flow. March to April.

O. Dakhel: Qasr; Mût; Great Oasis.

Only known from these localities.

705. (6.) ***Lotus lanuginosus*** Vent. Malm. (1803). p. 92. — Boiss. Flor. Or. II, p. 169. — A perennial herb, 30—50 cm high, tomentellous; stems prostrate, branching, densely leafy. Petiole much shorter than the minute, obovate, often obcordate, leaflets. Peduncles 1—3-flowered, twice to four times as long as the leaf; calyx-lobes lanceolate-subulate, almost as long as the tube; corolla intensely purple; standard oblong-linear, much longer than the angled or curved keel; wings somewhat shorter than keel. — Flow. March to April.

M. ma. Mex.

Also known from Arabia Petraea.

706. (7.) ***Lotus arabicus*** L. Mant. (1764), p. 104. — Boiss. Flor. Or. II, p. 170. — Jacq. Hort. Vindob., tab. 155. — Aschers.-

Schweinf. Ill. Flor. d'Eg., p. 64 no. 331. — Sickenberg. Contrib. Flor. d'Eg., p. 218. — *Lotus roseus* Forsk. Flor. aeg.-arab., p. 140. — An annual herb, 30 cm to 1 m high, sparingly appressed-hairy, glaucescent; stems prostrate or ascending, much branched. Leaves very short-petioled, leaflets wedge-obovate, obtuse. Peduncles 3—5-flowered, nearly twice as long as the leaf; calyx-lobes linear-lanceolate, somewhat longer than the tube; flowers, 3 mm to 1 cm long; corolla pink; standard obovate, nearly twice as long as the calyx; keel bent at an obtuse angle; pod straight, 2—3 cm long, glabrous, terete, 4—5 times as long as the calyx. — Flow. March to April.

N. d. N. v. O. D. a. sept. D. a. mer. Everywhere on sandy places. The herb is said to be poisonous to cattle.

Local name: qabd; gaddûp; gathba.

Also known from Arabia Petraea.

707. (8.) ***Lotus glinoides*** Del. in Ann. Scienc. Natur. VII (1837), p. 286. — Boiss. Flor. Or. II, p. 173. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 64 no. 333. — Sickenberg. Contrib. Flor. d'Eg., p. 218. — Walp. Rep. I, p. 647. — Stems herbaceous, 30—50 cm or more long, thinly grey-silky. Leaflets 5, obovate-cuneate, 8—10 mm long, rather fleshy, glaucous, thinly grey-silky. Flowers solitary or in pairs on short pedicels in the axils of the leaves, or in clusters of 3—4 as if terminal on short leafy branches. Bracts trifoliate. Calyx 8 mm long, densely silky, the linear teeth reaching three-quarters of the way down. Corolla reddish, scarcely exceeding the calyx. Pod linear, glabrous, 16—20 mm long, slightly torulose, 8—10-seeded. — Flow. March to April.

N. d. N. v. D. a. sept. Common on sandy places.

Local name: qabd (Wilkinson).

Also known from Tripolitania and Arabia Petraea.

708. (9.) ***Lotus Schimperii*** Steud. Nomencl. II (1841), p. 75. — Boiss. Flor. Or. II, p. 170. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 64 no. 332. — Sickenberg. Contrib. Flor. d'Eg., p. 218. — Apressed hairy, glaucescent, stems prostrate, flexuous, leaves shortly petiolate; leaflets obovate; flowers 2—3, subsessile; calyx hairy as long as the corolla; standard oblong, keel small; pods curved, cinerascens, four times as long as the calyx. — Flow. March to April.

D. a. sept. Wady Môr. — **D. a. mer.** Mirsa Zebara.

Also known from Arabia.

709. (10.) ***Lotus angustissimus*** L. Spec. Plant. I (1753), p. 1090. — Boiss. Flor. Or. II, p. 171. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 64 no. 334. — Sickenberg. Contrib. Flor. d'Eg., p. 218. — *Lotus*

gracilis W. K. Plant. rar. Hung., tab. 229. — *Lotus palustris* Willd. Spec. Plant. III, p. 1394. — An annual plant, 20—30 cm high, sparingly hirsute, decumbent or ascending. Leaves short-petioled; leaflets of the lower leaves obovate, of upper oblong, acute. Peduncles filiform, twice as long as the leaf, 1—2-flowered; calyx-lobes lanceolate-subulate, longer than the tube; corolla once and a half as long as the tube, nearly as long as the corolla; standard obovate, keel obtuse-angled; pod oblong, 1 cm long, a little longer than the calyx. — Flow. March to April.

N. d. El-Merg. — **N. f.** Senûris. — **N. v.** Esne.

Also known from Southern Europe and the Orient.

var. **diffusus** (Sol.) Ascherson and Schweinfurth in Aschers.-Schweinf. Ill. Flor. d'Eg. (1887), p. 64 no. 334. — Sickenberg. Contrib. Flor. d'Eg., p. 218. — *Lotus diffusus* Jor. Engl. Bot., tab. 935. — In all parts glabrous. — Flow. March to April.

N. d. Damietta; Birket-el-Hagg; Fakûs; Etsa.

Also known from Southern Europe and the Orient.

710. (11.) **Lotus peregrinus** L. Spec. Plant. I (1753), p. 1090. — Boiss. Flor. Or. II, p. 172. — *Lotus oligoceras* Lam. Dict. III, p. 605. — An annual plant, 10—40 cm high, appressed-hairy or silky, diffuse. Leaflets obovate-cuneate, obtuse, stipulars ovate. Peduncles shorter than the leaf or as long as the leaf, 2—4-flowered, at length thickened; keel narrow, boat-shaped; pod straight, 2—5 cm long, 2 mm broad, obtuse, mucronate, scarcely torulose. — Flow. March to April.

M. ma. Alexandria-West. — **O.** Little Oasis.

Also known from Southern Europe.

711. (12.) **Lotus villosus** Forsk. Flor. aeg.-arab. (1775), p. LXXI no. 386. — not Burm. — Boiss. Flor. Or. II, p. 173. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 63 no. 335. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 603 no. 97. — Sickenberg. Contrib. Flor. d'Eg., p. 218. — Aschers. Flor. Rhinocol., p. 793 no. 90. — *Lotus pusillus* Viv. Flor. Libye., p. 47 tab. 17 fig. 3. — *Lotus halophilus* Boiss. and Sprun. Boiss. Diagn. Plant. Or., Ser. I fasc. II p. 37—38. — Aschers.-Schweinf. Primit. Flor. Marmarie., p. 603 no. 97. — *Lotus Aucheri* Boiss. and Sprun. Plant. Or., ser. I fasc. II p. 37—38. — An annual plant, 20—30 cm high, appressed-tomentellous. Leaflets minute, obovate-oblong, stipulars ovate. Peduncles twice to thrice as long as the leaf, slender, 1—2-flowered; corolla once and a half as long as the calyx; 8 mm long, keel boat-shaped; pods 2—3 cm long, slender, somewhat flattened and torulose, obliquely mucronate. — Flow. March to April.

M. ma. Marmarica: Matruqa; Abusir; Alexandria-West and -East.
— **M. p.** Rosetta; Damietta; Qatiya to el-'Arish and el- Grady. —
N. d. D. l. D. i. D. a. sept. Everywhere abundant in sandy places.

Local name: qarn-el-ghazâl (Forsk.); horbeh; horbith (Ascherson).

Also known from Greece, Sicily, Algeria, Tunisia, Tripolitania and Syria.

var. **Aschersonii** Schweinfurth and Muschler var. nov. — Seeds
8—10 mm long, much larger than in the type. — Flow. March
to April.

O. Little Oasis; Farâfra; Dakhel; Great Oasis.

Local name: horbeh; horbith (Ascherson).

Only known from these localities.

712. (13.) **Lotus ornithopodioides** L. Spec. Plant. I (1753),
p. 1091. — Boiss. Flor. Or. II, p. 173. — Aschers.-Schweinf. Ill. Flor.
d'Eg., p. 64 no. 336. — Sickenberg. Contrib. Flor. d'Eg., p. 218. —
An annual plant, 30—50 cm high, appressed-pubescent, diffuse.
Leaflets obovate to rhombic. Peduncle longer than leaf. 3—5-flowered;
corolla 1 cm long, keel boat-shaped; pod 4 cm long, 2 mm broad,
much flattened, torulose, slightly curved. — Flow. March to April.

M. ma. Mariut; Alexandria-West and -East.

Also known from the other parts of the Mediterranean region.

713. (14.) **Lotus edulis** L. Spec. Plant. I (1753), p. 1095. —
Boiss. Flor. Or. II, p. 173. — Rehbch. Ic. XXII, p. 133 fig. 1—2. —
Aschers.-Schweinf. Ill. Flor. d'Eg., p. 64 no. 337. — Sickenberg.
Contrib. Flor. d'Eg., p. 218. — Aschers.-Schweinf. Primit. Flor.
Marmar., p. 603 no. 98. — An annual herb. 20—40 cm high, villous-
pubescent, ascending or diffuse. Stipulars cordate-ovate; leaflets
wedge-obovate. Peduncles 1-rarely 2-flowered, twice to thrice as
long as the leaves; calyx-lobes lanceolate-linear, twice as long as
the tube; corolla 1.5 cm long, standard round, keel gradually curved;
pod curved, 3—4 cm long, 5 mm thick, mucronate-hooked. — Flow.
March to April.

M. ma. Marmarica: Matruqa; Dakalla; Mariut; Alexandria-West.

Also known from all the other parts of the Mediterranean region.

285. (19.) **Tetragonolobus** Scop.

Calyx 5-fid. Keel beaked, curved downward. Stamens diadel-
phous. Style thickened above, stigma tapering. Pod cylindrical,
the nerves of the sutures dilated into wings. — Herbs with aspect
of *Lotus*.

A small genus in the Mediterranean region; one species extending to
Middle Europe.

714. **Tetragonolobus palaestinus** Boiss. Diagn. Plant. Or., Ser. II (1856), p. 20. — Flor. Or. II, p. 175. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 63 no. 338. — Sickenberg. Contrib. Flor. d'Eg., p. 218. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 603 no. 99. — An annual plant, 30—50 cm high, hirsute, stems ascending. Stipulars adnate to the petiole; leaflets large, ovate-rhombic. Peduncle 1—2-flowered, shorter than the leaves; calyx-lobes linear, purple, once and a half as long as the calyx, wings of the pod narrow; slightly wavy. — Flow. March to April.

M. ma. Marmarica: Matruqa; Mariut; Alexandria-West and -East.

Local name: qarn-el-kebsh (Ascherson).

Also known from Arabia Petraea and Palestine.

286. (20.) **Psoralea** Linn.

Calyx campanulate, 5-lobed. Petals nearly of equal length; keel obtuse. Ovary 1-ovuled, style filiform, stigma capitellate. Pod 1-seeded, indehiscent, the pericarp usually adherent to the seed. — Glandular-dotted herbs or shrubs, with trefoil leaves and racemed or capitate, (in ours) violet flowers.

A large genus of shrubs and herbs, common in the tropics and subtropics of both hemispheres almost always copiously sprinkled with resinous, black or pellucid dots, and strongly scented.

715. **Psoralea plicata** Del. Illustr. Flor. d'Eg., (1813), p. 322 tab. 37 fig. 3. — Boiss. Flor. Or. II, p. 186. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 65 no. 346. — A low shrub with striated glabrous woody stems, copious erecto-patent rigid branches and spiny branchlets. Leaves pinnately trifoliate, the petioles 4—6 mm long, terminal leaflet, 4—8 mm long, half as broad, oblong, deeply crenate, lateral ones smaller, firm, both sides coated with fine silvery pubescence. Flowers in copious short-stalked axillary racemes of 6—12 flowers each. Podicels very short. Calyx tubular, 2—5 mm long, 10-nerved, silvery, the teeth deltoid, not reaching a quarter of the way down, the lower one rather narrower and deeper, the tube dilated when the fruit is produced. Corolla cream-coloured, scarcely exceeding the calyx. Pod villose, ultimately black, equalling the calyx. — Flow. April to May.

N. v. D. l. D. a. sept. D. a. mer. A characteristic plant for the borders of the desert.

Local name: gettiât (Schweinfurth).

Also known from Tropical Africa and the Cape.

287. (21.) *Indigofera* Linn.

Calyx small, oblique, campanulate or tubular, teeth equal or the lowest longer than the rest. Standard ovate or orbicular, sessile or unguiculate; wings oblong, adhering a little to the keel; keel obtuse or acuminate, gibbous or spurred on both sides. Upper stamen free from the base, the others connate; anthers uniform, the connective forming an apiculus. Ovary sessile or nearly so, usually with several, sometimes with only one or two ovules; style glabrous; stigma capitate. Pod linear or oblong, rarely globose, straight or curved, terete or tetragonous or compressed, septate internally. — Herbs or shrubs of very various habit, more or less clothed with adpressed silky hairs fixed by the middle, and sometimes also with laxer pubescence. Leaves in our species simple or pinnately 3- ∞ -foliolate.

A large genus, nearly restricted to the Tropics, except in South Africa, with a greater number of species in Africa than anywhere else, not less than 200 including the Cape and Mascarene forms.

A. *Euinigofera*. Pods linear, terete or subtetragonous, 2-or many-seeded, unarmed.

- I. Leaflets 3—5 1. *I. paucifolia*.
- II. Leaflets 6—9 2. *I. argentea*.

B. *Amecarpus*. Pods linear, flattened, bi-or multiovulate unarmed.

- I. Pod recurved 3. *I. anabaptista*.
- II. Pod straight 4. *I. arabica*.

716. (1.) *Indigofera paucifolia* Del. Illustr. Flor. d'Eg. (1813), p. 127 tab. 37 fig. 2. — Boiss. Flor. Or. II. p. 190. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 65 no. 348. — Sickenberg. Contrib. Flor. d'Eg., p. 219. — *Indigofera erythrantha* Hochst. in Schimp. Herb. Abyss., no. 2178. — DC. Prodrum. II. p. 224. — A suberect shrub 2—3 m high, with slender, terete, flexuose, argenteous canescent branches. Stipules minute, linear-subulate, deciduous. Petioles 6 to 8 mm, argenteous. Leaflets 3—5, obovate-oblong, the terminal one 6—9 lines long, blunt with a mucro, the lateral ones laxly placed, usually alternate, both sides grey-green, and especially the under one argenteous. Racemes short-stalked, 20—40-flowered, usually exceeding their leaves. Pedicel and calyx 2 mm, both argenteous, the lower teeth of the latter lanceolate, as long as the tube. Corolla scarlet, twice the calyx, argenteous externally. Pod 2—3 cm long, 2 mm broad, linear, slightly upcurved and torulose, glaucous, 6—8-seeded. — Flow. March to April.

N. v. Siut; Farshut; Girge; Karnak; Esne; Gebel Silsile; Aswân.
 — **O.** Dakhel. — **D. l.** Abu Roash, rare. — **D. a. sept.** Wady Abad.
 — **D. a. mer.** Mirsa Zebara; Wady Lekhuma.

Local name: widneh (Schweinfurth); dahazyr; shedid.

Also known from Tropical Africa, Arabia and East India.

717. (2.) **Indigofera argentea** L. Mant. (1764), p. 27. — Boiss. Flor. Or. II, p. 190. — DC. Prodr. II, p. 224. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 65 no. 349. — Sickenberg. Contrib. Flor. d'Eg., p. 219. — Indigofera glauca Lam. Encyclop. III, p. 246. — Indigofera tinctoria Forsk. Flor. aeg.-arab., p. 138 not Linn. — Indigofera articulata Gouan. Illustr., p. 49. — Indigofera coerulea Roxb. Flor. Ind. III, p. 337. — A copiously branched shrub, 1—2 m high, the branches firm, sulcate silvery. Stipules small, setaceous. Petioles 1 cm long, firm, erecto-patent. Leaves 4—6 cm long with 4 pairs of leaflets, which are obovate, 1—2 cm long, the lateral ones opposite, short-stalked, both sides permanently silvery, turning blackish when dried. Racemes 12—20-flowered, 2—2½ cm long when in flower, sessile or nearly so. Pedicel about equalling the silvery calyx, which is half a line deep, teeth reaching about halfway down. Corolla yellow, about 4 times as long as the calyx. Pod deflexed, sickle-shaped, 1 cm long, 2 mm thick, terete, slightly torulose, glabrous when mature, 3—4-seeded. — Flow. February to March.

N. v. O. Cultivated everywhere; subsponaneous. — **D. a. mer.** Spontaneous.

Local name: nil.

Also wild and cultivated in Tropical Africa, Arabia and the East India.

718. (3.) **Indigofera anabaptista** Steud. Nomencl. Bot. ed. 2 Vol. I (1841), p. 805. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 65 no. 347. — Indigofera ornithopodioides Hochst. and Steudn. in Schimp. Herb. Abyss., no. 769. — Jaub. and Spach Illustr. Plant. Orient., tab. 480 not Cham. and Schlecht. — Boiss. Flor. Or. II, p. 188. — Indigofera Hochstetteri Baker in Oliver Flor. Trop. Af. II, p. 101. — Stems herbaceous, 30 cm or more long, copiously and diffusely branched from the base, the branchlets slender, angular, moderately silvery. Stipules minute, setaceous. Petioles 0.5—1 cm long. Leaflets in 1—3 pairs, oblong-lanceolate, 1—2 cm long, the lateral ones distant, slightly stalked, the apex rounded and mucronate, both sides glaucous, and permanently thinly coated with strong adpressed silvery hairs. Flowers in close oblong racemes of about 12 each, not above 1 cm long till the fruit is produced, on peduncles 5 mm or less long. Calyx silvery, 3 mm deep, cut down nearly to the base, the teeth setaceous, the lowest the longest. Corolla pink, about equal-

ling the calyx. Pods deflexed and then again slightly recurved, linear-mucronate, 1—2 cm long, 3 mm broad, 6—8-seeded. — Flow. March to April.

N. v. Aswân; Philae and the other Island, abundant. — **O.** Great Oasis.

Local name: dahazyr.

Also known from Tropical Africa, extends through Arabia to Scinde.

719. (4.) **Indigofera arabica** Jaub. and Spach Illustr. Plant. Orient. V, tab. 479 (1853—57). — Boiss. Flor. Or. II, p. 189. — Stem nearly or quite woody below, diffusely branched from the base, about a span high, young branches firm, angular, densely silky. Stipules small, setaceous. Petioles very short. Leaflets 3—5, obovate or oblanceolate, 5—12 mm long, 4—6 mm broad, lateral ones sessile and close, all often folded with a decurved point, texture thick, both sides densely and permanently silvery. Flowers in short close racemes of 6—10 each, which are nearly sessile in the axils of the leaves. Pedicels very short. Calyx campanulate, silvery, 3 mm deep, the teeth subequal, setaceous, reaching three-quarters of the way down. Corolla scarlet, nearly twice as long as the calyx. silvery externally. Pod 5—8 mm long, 2 mm broad, linear-oblong mucronate, subtorulose and slightly silvery, 4—5-seeded. — Flow. March to April.

D. a. sept. Suez.

Also known from Arabia.

288. (22.) **Tephrosia** Pers.

Calyx 5-toothed. Standard broad, as long as or longer than the obtuse keel. Upper stamen free at the very base, but adhering to the sheath of the others in the middle. Style curved, glabrous, but sometimes with a tuft of hairs on the terminal stigma. Pod linear, compressed, 2-valved, without partitions between the seeds. — Herbs or rarely shrubs. Leaves impari-pinnate, with several pairs of opposite leaflets, rarely reduced to a single leaflet, their veins numerous, parallel and oblique. Racemes terminal, leaf-opposed, or in the upper axils, often leafy at the base. Flowers 2—6 together at each bract.

A widely spread tropical genus.

A. Pod linear, many-seeded 1. **T. apollinea**.

B. Pod ovate, one-seeded 2. **T. pogonostigma**.

720. (1.) **Tephrosia apollinea** (Del.) DC. Prodr. II (1825), p. 254. — Boiss. Flor. Or. II, p. 192. — Aschers.-Schweinf. Ill. Flor

d'Eg., p. 65 no. 350. — Sickenberg. Contrib. Flor. d'Eg., p. 219. — Galega Apollinea Del. Illustr. Flor. d'Eg., p. 144 tab. 33. — Stems suffruticose, 24—40 cm high, diffusely branched from the base, the branches firm, subglabrous. Stipules linear, firm, 4 mm long. Petioles 1—2 cm long. Rhachis 2 cm or less long; leaflets in 2—4 pairs, oblong or oblanceolate, 1—3 cm long, 5—10 mm broad, apex emarginate and mucronate, the upper surface quite and the lower nearly glabrous. Racemes terminal or lateral, laxly 6—12-flowered, stalked or sessile. Bracts linear, rigid like the pedicel equalling the calyx, which is subglabrous, 4 mm deep, the teeth linear-subulate, reaching halfway down. Corolla red, twice as long as the calyx, the standard 10 mm broad. Pods linear, slightly upcurved, 3—5 mm long, 4 mm broad, glabrous, 6—9-seeded. Style glabrous, pencillate at the top. — Flow. March to April.

N. v. N. f. O. D. l. D. a. sept. D. a. mer. Everywhere abundantly on alluvial soil.

Local name: tabshanqîq; amyân (Nub.).

Also known from tropical Africa to East India.

721. (2.) **Tephrosia pogonostigma** Boiss. Flor. Or. II (1872), p. 193. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 65 no. 351. — Psoralea arabica Hochst. and Steudn. in Schimp. Plant. exsicc. — Ic. Jaub. and Spach V, tab. 475. — Pogonostigma arabicum Boiss. Diagn. Plant. Or., Ser. II fasc. 1—2 p. 40. — Stems woody, 20 to 30 cm long, diffusely branched, the branches terete, densely coated with short white silky pubescence. Stipules lanceolate, 8 mm long. Leaves nearly sessile, the rhachis woolly like the branches, the leaflets in 3—4 pairs, oblanceolate, 2—2½ cm long, 4—6 mm broad, apex rounded, mucronate, both sides very pale, and especially the lower one densely white-silky. Racemes terminal or leaf-opposed, 6—12-flowered, 6—8 cm long, on long or short rigid peduncles. Pedicels and bracts shorter than the calyx, which is 4—6 mm deep, densely white-silky, the teeth linear, reaching more than halfway down. Corolla pinkish, slightly exceeding the calyx, the standard 5 mm broad, very silky on the back. Pod twice as long as the calyx, densely clothed with long half-spreading white silky hairs, 1-seeded. — Flow. March to April.

D. a. mer. Bay of Berenice.

Also known from Arabia Felix.

289. (23.) **Astragalus** Linn.

Calyx campanulate, turbinate, or tubular, in fruit unchanged or torn or inflated, teeth 5, equal or somewhat unequal. Standard

various. Keel obtuse, rarely acute, never acuminate-cuspidate; claws of wings and keel free or nearly so, more or less adnate to the staminal tube. Style generally beardless, sometimes bearded, stigma naked, rarely bearded. Pod sessile or stipitate, varying much in form, bivalved, generally inflexed at the dorsal suture so as to be completely or incompletely 2-celled, often however quite 1-celled, the ventral suture rarely inflexed, in which case it may touch the inflexed dorsal suture. — Annual or perennial herbs or shrubs, the leaves odd-pinnate, or, if abruptly pinnate, the petiole elongated, unarmed or spinescent.

A very large genus, with its head-quarters in the Western half of Asia, with many species in Eastern Asia, Europe, and round the shores of the Mediterranean, a few in the Andes and Temperate South America, and only one in Natal.

Series A. *Monocarpia*. Annuals or biennials.

I. Stipules free.

a) Flowers in heads.

1. Valves of the pod keelless.

α) Internal dissepiment of the pods
very incomplete 1. *A. prolixus*.

β) Internal dissepiment of the pods
complete.

† Heads sessile.

* Calyx-teeth shorter than
the tube 2. *A. tribuloides*.

** Calyx-teeth longer than
the tube 3. *A. sinaicus*.

†† Heads peduncled.

* Peduncles longer than
the pod 4. *A. cruciatus*.

** Peduncles shorter than
the pod 5. *A. radiatus*.

*** Peduncles as long as the
pod 6. *A. Schimperii*.

2. Valves of the pods keeled.

b) Flowers racemed, or racemed capitate.

1. Pods linear, more or less strongly
curved.

α) Stigma bearded.

† Standard as long as the keel 7. *A. contortuplicatus*.

†† Standard shorter than the keel 8. *A. falcinellus*.

††† Standard longer than the keel 9. *A. eremophilus*.

β) Stigma not bearded.

† Pods glabrous 10. *A. corrugatus*.

†† Pods pubescent.

* Leaflets 1—3 pairs.

Δ Leaflets elliptical . . 11. *A. gyzensis*.ΔΔ Leaflets ovate . . . 12. *A. annularis*.

** Leaflets 7—10 pairs.

Δ Pod semicircular . . 13. *A. trimestris*.ΔΔ Pod flattened-cylindrical 14. *A. hispidulus*.ΔΔΔ Pod erect, annular, shortly mucronate . . 15. *A. mareoticus*.2. Pods oblong, thick, slightly curved . 16. *A. baeticus*.

II. Stipules connate.

a) Pod linear-terete, falcate or hooked.

Leaflets glabrous above.

1. Peduncle shorter than the leaf . . 17. *A. hamosus*.2. Peduncle longer than the leaf . . . 18. *A. brachyceras*.

b) Pod linear-lanceolate or oblong, straight or slightly curved.

1. Peduncle as long as the leaf . . . 19. *A. bombycinus*.2. Peduncle shorter than the leaf . . 20. *A. peregrinus*.Series B. *Perennials*.

I. Hairs simple, fixed at the base.

a) Fruiting calyx not inflated.

1. Pod papery or leathery 21. *A. alexandrinus*.

2. Pod fleshy or woody.

α) Leaflets 20—30 pairs.

† Leaflets orbicular-obcordate . 22. *A. tomentosus*.†† Leaflets ovate 23. *A. Sieberi*.

β) Leaflets 5—7 pairs.

† Calyx-teeth one-third as long as the tube 24. *A. trigonus*.†† Calyx-teeth one-fourth as long as the tube 25. *A. leucacanthus*.

b) Calyx inflated in fruit, and sometimes in flower.

1. Leaflets abruptly pinnate. Petioles spiny. Flowers solitary or twin . . 26. *A. Forskålei*.2. Leaflets all pinnate. Petioles unarmed. Flowers capitate or racemed . . . 27. *A. cahircicus*.II. Hairs bicuspid, fixed by their middle . . 28. *A. camelorum*.

722. (1.) **Astragalus prolixus** Sieb. ex Bunge Astragal. I (1868—1869), p. 6. — Boiss. Flor. Or. II, p. 223. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 60 no. 354. — Sickenberg. Contrib. Flor. d'Eg., p. 219. — Phaca Vogelii Webb ap. Hook. Niger Flor., p. 123 tab. 8. — Stems annual, procumbent, 30 cm or more long, copiously and diffusely branched from the base, the branches slender, finely grey-silky. Stipules lanceolate, 4 mm deep, free to the base. Leaves sessile; rachis 2—2½ cm long; leaflets in 5—6 pairs, oblanceolate or oblong, 5 mm long by about half as broad, both sides densely grey-silky. Racemes 6—12-flowered, ultimately equalling or exceeding the leaves. Bracts setaceous, exceeding the short pedicels. Calyx tubular, a line deep, silky, the teeth linear or lanceolate, reaching about a quarter of the way down. Corolla yellowish, not much exceeding the calyx. Pod oblong, very turgid, 5 mm long by half as broad, silky, the dissepiment produced about half-way through in the lower part, seeds 2—3 in each cell. — Flow. March to April.

N. v. mer. O. D. l. D. i. D. a. sept. D. a. mer. A common plant on sandy ground.

Local name: beyd-el-gemel; tawil.

Extends from the Cape Verde Islands to Arabia.

723. (2.) **Astragalus tribuloides** Del. Illustr. Flor. d'Eg. (1813), no. 696 tab. 64 fig. 17. — Boiss. Flor. Or. II, p. 224. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 66 no. 355. — Aschers. Flor. Rhinocol. p. 795. — Sickenberg. Contrib. Flor. d'Eg., p. 219. — Aschers.-Schweinf. Primit. Flor. Marmarie., p. 603 no. 103. — Astragalus arenicola Pomel Nouv. math., p. 184. — An annual herb, 3 to 10 cm high or more, apressed-silky, branching from the neck; branches prostrate. Leaflets 6—10 pairs, elliptical-oblong, crowded. Heads 3—6-flowered, axillary, sessile or nearly so; flowers 1 cm long; calyx tubular, teeth awl-shaped; pods appressed-hairy, 1 cm long, oblong-triangular, slightly curved, acutish, base retuse, bigibbous. — Flow. March to April.

M. ma. Abusir; Mariut; Alexandria-West and -East; Mandara, in sandy places, abundantly. — **M. p.** El-'Arish. — **D. l.** Es-Sabrigât; Beni-Selâma; Kafr Hakim; Abu Roash; Pyramids of Saqqâra, not common. — **D. i.** Es-Sâlihîya, in deep sandy places; El-Qantara; Ismailia; Ramses Station, not common. — **D. a. sept.** Serapeum; Bir Suez; Suez, on sandy hills, common; Tura; Ma'sara; Helwân. — **O.** Siwa.

Local name: beyd-el-djemel (Ascherson).

Also known from Algeria, Tunisia, Tripolitania, Arabia Petraea, Syria, Persia to India.

724. (3.) **Astragalus sinaicus** Boiss. in Diagn. Plant. Orient., Ser. I fasc. IX (1849) p. 57. — Flor. Or., Supplem. (1888) p. 174. — *Astragalus pseudostella* Boiss. Flor. Or. II, p. 225 not Delile. — 5—10 cm high, grey-hirsute; stems diffuse. Leaflets 8—10 pairs, oblong-elliptical. Heads axillary, sessile, 5—6-flowered; calyx bell-shaped tubular, teeth as long as the tube; pods 1—1.5 cm long, stellate, lanceolate-triangular, acute, straightish, hirsute with spreading hairs. — Flow. March to April.

M. ma. Alexandria-West.

Also known from Algeria, Tunisia, Tripolitania, Greece and Arabia Petraea.

725. (4.) **Astragalus cruciatus** Link Enum. Hort. Berol. II (1822), p. 256. — Boiss. Flor. Or. II, p. 225. — Bonn. and Barr. Illustr. Tunis, tab. VII fig. 9—15. — *Astragalus stella* Viv. Flor. Libye., p. 45. — An annual plant 10—30 cm high, or more, grey-hairy; stems procumbent or ascending. Leaflets elliptical, 6—10 pairs. Heads 3—6-flowered, peduncles longer than the pods and often than the leaf; flowers 8 mm to 10 cm long, pods stellate, 1.5—2 cm long, linear-lanceolate, triangular, bigibbous at the base, appressed-hairy. — Flow. March to April.

D. a. sept. Wady Khafûra in the Northern Galala.

Also known from Morocco, Algeria, Tunisia, Syria, Palestine and Transcaucasia.

726. (5.) **Astragalus radiatus** Ehrenberg msscr. sec. Bunge Astragal. I part. (1868—1869), p. 8. — Boiss. Flor. Or. II, p. 226. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 66 no. 356. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 754. — Sickenberg. Contrib. Flor. d'Eg., p. 219. — Aschers. Flor. Rhinocol., p. 795 no. 96. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 603 no. 104. — *Astragalus pseudostella* Del. Illustr. Flor. d'Eg., tab. 64 fig. 15. — An annual plant, 10—30 cm high, appressed-canescens, procumbent or ascending. Leaflets elliptical, 6—8 pairs. Heads 5—9-flowered; peduncles shorter than the leaf; flowers 4—5 mm long; pods short, stellate, oblong from a bigibbous base, acute, straightish, appressed-hairy. — Flow. March to April.

M. ma. Marmarica: Matruqa; Dakalla; Alexandria-West and -East. — **M. p.** El-'Arîsh. — **D. i.** Ramses. — **D. a. sept.** Wady Khafûra.

Local name: tawîl.

Also known from Algeria, Tunisia, Tripolitania, Arabia Petraea and Palestine.

727. (6.) **Astragalus Schimperi** Boiss. Diagnos. Plant. Orient., Ser. I fasc. II (1843) p. 53. — Flor. Or. II, p. 226. — Bunge Astragal. 1, p. 9. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 66 no. 357. — Sickenberg. Contrib. Flor. d'Eg., p. 219. — An annual herb, 5—20 cm high or sometimes more, appressed-tomentellous, procumbent. Leaflets 4—8 pairs, oblong elliptical, obtuse. Heads 2—6-flowered; peduncle as long as the pod or leaf; pods spreading, 1,5—2 cm long, linear-oblong, nearly terete, straightish, abruptly tapering at the tip, densely hispid with spreading hairs. — Flow. February to March.

D. a. sept. Wady Gerrawy near Helwân, on calcarious ground; near the baths of Helwân in deep sand.

Local name: qureidûn-aswad.

Also known from Tripolitania and Arabia Petraea.

728. (7.) **Astragalus contortuplicatus** L. Spec. Plant. I (1753), p. 1068. — Boiss. Flor. Or. II, p. 230. — Ic. Pall. Astrag., tab. 79. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 66 no. 358. — An annual herb, villous; stems erect or procumbent; leaflets 7—10 pairs, obovate-oblong, or oblong, retuse; stipules large, ovate; peduncles much shorter than the leaf; calyx-teeth subulate as long as the tube or somewhat longer, as long as the corolla; pods confert, annular, villous. — Flow. March to April.

N. d. Banks of the Masama-lake (Schweinfurth).

Also known from Southern and Middle Europe and East India.

729. (8.) **Astragalus falcinellus** Boiss. Diagnos. Plant. Or., ser. I fasc. IX (1849) p. 63. — Flor. Or. II, p. 230. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 66 no. 359. — An annual herb, appressed-hairy, stems erect, elate, shortly branched; leaflets 7—8 pairs, oblong, obtuse; calyx-teeth linear as long as the tube; standard abbreviate; keel shorter than the standard; pod erect, compressed, falcate, acute, 18—20-ovulate, curved, appressed-hairy. — Flow. February to March.

N. v. Pyramids of Giza, on alluvial ground.

Only known from this locality.

730. (9.) **Astragalus eremophilus** Boiss. Diagn. Plant. Orient., ser. I fasc. IX (1849) p. 54. — Flor. Or. II, p. 230. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 66 no. 360. — Sickenberg. Contrib. Flor. d'Eg., p. 220. — An annual plant, 30—40 cm high, sometimes more, grey-puberulent, prostrate. Leaflets 4—6 pairs, obovate, retuse. Racemes loosely 2—4-flowered; peduncle shorter or longer than the leaf; standard a little longer than the keel; pods 2,5 cm long, 3 mm thick, somewhat flattened, semicircular, acute, 18—20-seeded, villous. — Flow. March to April.

O. Great Oasis, in deep sandy places. — **D. a. sept.** Serapeum; Bir Suez, common on sand-hills; Suez; Tura; Gharib; Atfih, not common. — **D. a. mer.** Between Kene and Qoseyr; Qoseyr.

Local name: umm-el-qoreyn (Schweinfurth); faga'â; mukd (Klunzinger).

Also known from the deserts of Arabia Felix.

731. (10.) **Astragalus corrugatus** Bertol. in DC. Prodrum. II (1825), p. 289. — Boiss. Flor. Or. II, p. 232. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 66 no. 361. — Sickenberg. Contrib. Flor. d'Eg., p. 220. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 754. — *Astragalus trunestris* Boiss. Flor. Or., Suppl. p. 175 ex part. not Linn. — An annual herb, 30—40 cm high, sometimes somewhat more, sparingly appressed-hairy, procumbent. Leaflets 5—8 pairs, linear-cuneate, retuse. Racemes 1—4-flowered; peduncle as long as or longer than the leaf; pods 3—4 cm long, 3 mm thick, semicircular, hooked at the tip, transversely wrinkled. — Flow. February to March.

D. i. Ramses. — **O.** Dakhel.

Also known from Arabia Petraea, Babylonia to Persia.

732. (11.) **Astragalus gyzensis** Delile Illustr. Flor. d'Eg. (1813), tab. 64 fig. 14. — Boiss. Flor. Or. II, p. 234. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 66 no. 364. — Sickenberg. Contrib. Flor. d'Eg., p. 220. — Bunge *Astragalus* 1, p. 16. — *Astragalus Hauarensis* Boiss. Diagnos. Plant. Orient., Ser. I fasc. IX p. 63. — An annual herb; 5—10 cm high, sometimes more, appressed-grey-puberulent, spreading. Leaflets 1—3 pairs remote, broad-elliptical to elliptical-oblong, retuse, the terminal larger, often 8 mm long, 6 mm broad. Racemes loosely 3—5-flowered; peduncles shorter than the long-petioled leaf; corolla whitish; pods 2.5—3 cm long, 3 mm thick, semicircular, beset with two kinds of hairs, one short, appressed, the other longer, spreading, tubercled at the base, short-mucronate. — Flow. March to April.

D. i. Pyramids of Giza and Saqqâra. — **D. i.** Ismailia. — **D. a. sept.** Wady Gerrâwy near Helwân; Great Petrified Forest near Cairo.

Local name: dan-el-fâra (Ehrenberg).

Also known from Tunisia, Algeria and Arabia Petraea.

733. (12.) **Astragalus annularis** Forsk. Flor. aeg.-arab. (1775), p. 139. — Boiss. Flor. Or. II, p. 236. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 66 no. 366. — Sickenberg. Contrib. Flor. d'Eg., p. 220. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 603 no. 106. — Aschers. Flor. Rhinocol., p. 795 no. 100. — Bunge *Astragal.* I, p. 15. —

Astragalus trimorphus Viv. Flor. Libyc., p. 44 tab. 10 fig. 2. — *Oxytropis amularis* DC. Prodrum. Astragal., tab. 7. — An annual plant, 10—30 cm high, sometimes somewhat more, pubescent, diffuse. Leaflets 1—3 pairs, obovate to obovate-oblong, obtuse. Racemes 2—4-flowered; peduncle about as long as the leaf; pods 4—5 cm long, 2 mm thick, semicircular to circular, ending in a short, incurved point, appressed-bristly, at length glabrescent, mottled with red. — Flow. March to April.

M. ma. Marmarica: Matruqa; Dakalla; Montaza; Alexandria-West and -East; Mandara; Abukîr. — **M. p.** Rosetta; Damietta, in deep sandy places; Qatîya to El-'Arîsh; El-Grâdy in sandy places along the coast common. — **D. i.** Es-Sâlihiya, a characteristic plant of the sand hills; Ismailia; Ramses-Station. — **D. a. sept.** Gebel ahmar and Petrified Forest near Cairo; Masa'ra; near Helwân, rare in deep sand.

Local name: horbuth (Schweinfurth); mahallaq (Deflers).

Also known from Tunisia, Algeria, Arabia Petraea and Palestine.

734. (13.) ***Astragalus trimestris*** L. Spec. Plant. I (1753), p. 1073. — Boiss. Flor. Or. II, p. 234. — Ic. Jacq. Hort. Vindob., tab. 174. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 66 no. 363. — Aschers. Flor. Rhinoc., p. 795. — Aschers. Flor. Sirb., p. 812. — Sickenberg. Contrib. Flor. d'Eg., p. 220. — Aschers. Flor. Rhinocol., p. 795 no. 97. — An annual small herb. Hairy, diffuse. Stipules minute, subulate from a broader base; leaflets crowded, 8—10 pairs, elliptical, retuse. Raceme 2—5-flowered; peduncle about as long as the leaf; corolla whitish; pods 5 cm long, 3 mm thick, semicircular, short-mucronate, sparingly appressed-hairy. — Flow. March to April.

M. ma. Montaza; Alexandria-West, in sandy places, rare. — **M. p.** Rosetta; El-'Arîsh to Sheykh Zoyêd.

Also known from Arabia Petraea.

735. (14.) ***Astragalus hispidulus*** DC. Astragalog. (1802), p. 132 tab. 13. — Prodrum. II, p. 289. — Boiss. Flor. Or. II, p. 235. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 66 no. 365. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 754. — Aschers. Flor. Rhinocol., p. 795 no. 98. — Sickenberg. Contrib. Flor. d'Eg., p. 220. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 603 no. 105. — *Astragalus biflorus* Viv. Flor. Libyc., p. 44 tab. 20 fig. 1. — An annual plant, 30—50 cm high, sparingly pubescent, somewhat diffuse. Leaflets 6—7 pairs, elliptical-oblong, obtuse. Racemes 3—4-flowered; peduncle about as long as the leaf; calyx cylindrical; standard ovate-oblong, gradually tapering; pod flattened-cylindrical, slender 4 cm long,

1.5 mm broad; semicircular, acute, appressed-bristly. — Flow. March to April.

M. ma. Marmarica: Matruqa; Ras-él-Kena'is; Mariut; Montaza; Alexandria-West and -East. — **M. p.** El-'Arish; Henwah. — **D. i.** El-Qantara.

Local name: qoreyn.

Also known from Palestine.

736. (15.) **Astragalus mareoticus** Del. Illustr. Flor. d'Eg. (1813). p. 113 tab. 39 fig. 3. — Boiss. Flor. Or. II, p. 233. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 66 no. 362. — Sickenberg. Contrib. Flor. d'Eg., p. 220. — Hirsute. Stems prostrate; leaflets narrowed, 6—8 pairs, obovate-cuneate, retuse; racemes 3—4-flowered; peduncles shorter than the calyx; calyx-teeth lanceolate, as long as the tube; corolla pale violet, as long as the calyx; pods erect, annular, shortly mucronate, appressed-hairy. — Flow. February to March.

M. ma. Alexandria. — **D. a. sept.** Cairo to Suez.

Also known from Algeria.

737. (16.) **Astragalus baeticus** L. Spec. Plant. I (1753), p. 1068. — Boiss. Flor. Or. II, p. 236. — Rehbch. Ic. XXII. tab. 148. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 66 no. 367. — Sickenberg. Contrib. Flor. d'Eg., p. 220. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 603 no. 107. — An annual plant, 30—40 cm high or more, sparingly hairy, green, erect. Leaves 10 cm or more long; leaflets 9—10, oblong to linear, retuse. Lower flowers solitary, subsessile, upper racemes densely 2—15-flowered; peduncle shorter than the leaf; pods erect, prismatic-oblong, 3 cm long, 7 mm thick, obtuse, straight, hooked at the tip, appressed-bristly. — Flow. March to April.

M. ma. Marmarica: Matruqa; Dakalla; Mariut; Montaza; Alexandria-West. — **M. p.** El-Arish.

Local name: kreyshet-el-djedy (Ascherson).

Also known from all the other parts of the Mediterranean region.

738. (17.) **Astragalus hamosus** L. Spec. Plant. I (1753), p. 1067. — Boiss. Flor. Or. II, p. 238. — Rehbch. Ic. XXII, tab. 147 fig. 1. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 66 no. 368. — Sickenberg. Contrib. Flor. d'Eg., p. 220. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 603 no. 108. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 754. — Aschers. Flor. Rhinoc., p. 795 no. 101. — *Astragalus brachyceras* Boiss. Flor. Or., Supplem. p. 175 ex parte. — An annual herb, 30 to 40 cm high or more, appressed-pubescent, diffuse or erect. Leaflets 8—12 pairs, oblong to cuneate-oblong and linear, retuse. Racemes very short, axillary, 4—8-flowered; peduncles longer or shorter than

the leaves; pods spreading, oblong-linear, terete, 2 cm long, 3 mm thick, semilunar. — Flow. March to April.

M. ma. Marmarica: Matruqa; Mariut; Alexandria-West and -East; Abukir. — **M. p.** Bîr-Abû-Elfein; El-^cArîsh; El-Grâdy; Sheykh-Zoyêd.

Local name: goreyn.

Also known from the other parts of the Mediterranean region.

739. (18.) **Astragalus brachyceras** Ledeb. Ind. Plant. Dorp. (1822), p. 3. — DC. Prodrum. II, p. 290. — Boiss. Flor. Or. II, p. 238. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 66 no. 369. — Sickenberg. Contrib. Flor. d'Eg., p. 220. — *Astragalus hamosus* var. *brachyceras* Ledeb. Flor. Ross. I, p. 638. — *Astragalus arnoceras* Bunge Astrag., p. 14. — An annual plant, 30—40 cm high, appressed-hairy, ascending or diffuse. Leaflets 9—10 pairs, wedge-oblong, retuse. Racemes 3—7-flowered; peduncle half as long as the leaf; pods 5—6 cm long, cylindrical-terete, fishhook-shaped, nearly circular. — Flow. February to March.

N. f. Matar Târes; Fidemin; Gharaq.

Local name: deqîs.

Also known from Arabia Petraea and Northern East India.

740. (19.) **Astragalus bombycinus** Boiss. Diagnos. Plant. Orient., Ser. I fasc. 2 (1843) p. 50. — Flor. Or. II, p. 240. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 67 no. 370. — *Astragalus sultanensis* Bunge Astragal., p. 19. — An annual or biennial herb, 10—40 cm high or more, loosely clothed with wavy-white wool, prostrate. Leaflets 6—12 pairs, minute, obovate, retuse, often crowded. Racemes rather loose, 2—4-flowered; peduncle as long as the leaf, or shorter; calyx white-woolly; pods oblong-lanceolate, 2—3 cm long, 6 mm broad, incurved, ending in a short, straight, or somewhat incurved point, densely white-woolly, back broad-grooved, face keeled, netted-wrinkled toward margin. — Flow. March to April.

D. a. sept. Northern Galala.

Local name: khanseret-el-arûsa (Forskål); qerny (Schweinfurth).

Also known from Palestine to Persia.

741. (20.) **Astragalus peregrinus** Vahl Symbol. Bot. I (1790), p. 57. — Boiss. Flor. Or. II, p. 241. — DC. Astragal., p. 178 tab. 27. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 67 no. 371. — Sickenberg. Contrib. Flor. d'Eg., p. 220. — Aschers. Flor. Rhinocol., p. 795 no. 102. — Aschers.-Schweinf. Primit. Flor. Marmarie., p. 603 no. 109. — An annual herb, 10—25 cm high, or sometimes more, loosely white-villous, prostrate. Leaflets oblong-cuneate, retuse. Racemes rather

loose, 3—5-flowered, peduncle shorter than the leaf; calyx white-and black-hairy, teeth somewhat shorter than the tube; standard short, acute; pods lanceolate, 4 cm long, 6 mm thick, somewhat curved, acute, grooved at the back, keeled at the face, minutely rough-tubercled. — Flow. March to April.

M. ma. Marmarica: Matruqa; Mariut; Alexandria-West and -East. — **M. p.** Qatiya to El-'Arish; Sheykh-Zoyêd. — **D. i.** Sâlihiya.

Local name: kreysht-el-homâr; kreyssha.

Also known from Tunisia, Algeria, Tripolitania and Palestine.

742. (21.) **Astragalus alexandrinus** Boiss. Diagnos. Plant. Orient., Ser. I fasc. IX (1849) p. 74. — Flor. Or. II, p. 284. — Bunge Astragal. I, p. 48. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 67 no. 372. — Sickenberg. Contrib. Flor. d'Eg., p. 220. — Aschers.-Schweinf. Ill. Flor. d'Eg. Supplem., p. 755. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 693 no. 110. — Astragalus lanigerus Viv. Flor. Libye., p. 44 not Desf. — An perennial herb, 10—25 cm high, or more, hirsute, stemless. Leaflets 13—15 pairs, ovate to elliptical and oblong, upper surface glabrous. Racemes 5—7-flowered, short-peduncled; calyx-teeth one-third to one fifth as long as the tube; pods almost sessile, ovate, somewhat 3-angled, mucronate. — Flow. March. to May.

M. ma. Marmarica: Matruqa; Mariut; Montaza; Alexandria-West and -East; Mandara; Abukîr. — **M. p.** Rosetta; Damietta in deep sandy places; Qatiya to El-'Arish.

Local name: qarambûsh (Ascherson).

Also known from Tunisia, Tripolitania, Arabia and Palestine.

var. **elongata** Barb. Herb. au Lev. (1882), p. 131. — Racemes prostrate; leaves longer than in the type, canescent. — Flow. March.

N. d. Philistine.

Only known from this locality.

743. (22.) **Astragalus tomentosus** Lam. Dict. I (1790), p. 313. — Boiss. Flor. Or. II, p. 302. — DC. Astragal., tab. 29. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 67 no. 375. — Sickenberg. Contrib. Flor. d'Eg., p. 220. — Aschers.-Schweinf. Ill. Flor. d'Eg. Supplem., p. 755. — Aschers. Flor. Rhinocol., p. 795 no. 104. — Astragalus fruticosus Forsk. Flor. aeg.-arab., p. 139 (?). — Tomentous; stems elongate; stipules large, lanceolate; leaves elongate; leaflets 20—30 pairs, orbiculate-obcordate; flowers 3—4 axillary, sessile; calyx campanulate, villous; calyx-teeth lanceolate as long as the tube; standard oblong, obtuse; pods tomentellous, cylindrical-subcompressed. — Flow. March.

M. p. Rosetta.

Only known from Egypt.

744. (23.) **Astragalus Sieberi** DC. Prodom. II (1825), p. 295. — Boiss. Flor. Or. II, p. 301. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 67 no. 373. — Sickenberg. Contrib. Flor. d'Eg., p. 220. — Aschers. Flor. Rhinocol., p. 795 no. 163. — *Astragalus trigonus* Sieb. exs. not DC. — *Astragalus radicans* Decsne. Flor. Sinaic., p. 44. — *Astragalus Barba Aronis* Ehrenberg Msscr. — *Astragalus sparsus* Barbey Herb. au Lev., p. 131 not of Decsne. Flor. Sinaic., p. 45. — A perennial herb, 20–50 cm high, or more, stems short, leafy, appressed-canescens. Stipules triangular-tapering, hispid; leaflets 20–25 pairs, ovate, obtuse 3–5 mm long, conduplicate, glabrous above, appressed-hirsute below. Flowers axillary, nearly sessile; calyx-teeth one-quarter as long as the glabrescent tube; pod sparingly appressed-strigulose, oblong-triquetrous, slightly curved, 5 cm long, 8 mm broad, longitudinally wrinkled, tapering into a stout beak. — Flow. March to April.

M. p. Rosetta; Bîr Abu-Elfeîn. — **D. i.** Es-Sâlihîya. — **D. a. sept.** Wady Rished near Helwân; Suez.

Local name: khansîr-el-'arûs; isba'-el-'arûs; beyd-el-gutt; tîz-el-kelbeli; subb-el-kelb.

Also known from Arabia Petraea and Palestine.

745. (24.) **Astragalus trigonus** DC. Astragal. (1802), p. 81. — Boiss. Flor. Or. II, p. 302. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 67 no. 376. — Sickenberg. Contrib. Flor. d'Eg., p. 220. — Aschers. Fl. Rhinocol., p. 795 no. 104. — A shrubby plant, 25 cm high or more, much branched; branches thorny, short intricate; thorns strong, 2 cm long, close-set. Stipules triangular, acute, short; leaflets 6–7 pairs, minute, ovate-orbicular, retuse, glabrous above. Flowers 1–2, sessile, axillary, 1 cm long; calyx-teeth one-third as long as the tube; pod appressed-canescens, semi-oblong-triquetrous, 1.5 cm long, 5 mm broad, somewhat incurved, tapering to a beak. — Flow. March to April.

M. ma. Abusîr; Mariut; Alexandria.

Also known from Arabia Petraea and Palestine.

746. (25.) **Astragalus leucacanthus** Boiss. Diagn. Plant. Orient., Ser. I fasc. IX (1849) p. 93. — Flor. Or. II, p. 303. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 67 no. 377. — Sickenberg. Contrib. Flor. d'Eg., p. 220. — A shrubby herb 50–60 cm high, branches appressed-canescens. Thorn 5 cm long; stipules triangular-acuminate; leaflets 5–6 pairs, ovate, obtuse, sparingly appressed-hirsute below. Racemes 2–4-flowered, axillary, nearly sessile; flowers 1–1.3 cm long; calyx-teeth one-fourth as long as the tube; pod appressed-

canescent, 1,5 cm long, semi-oblong-triquetrous, acuminate. — Flow. March to April.

M. ma. Mex. — **O.** Dakhel; Great Oasis. — **D. i.** Gebel Ekfên; Es-Sâlihiya; Ismailia. — **D. a. sept.** Gebel ahmar near Cairo, abundant on calcareous ground; Suez.

Also known from Arabia Petraea.

747. (26.) **Astragalus Forskålei** Boiss. Diagnos. Plant. Orient., Ser. I fasc. IX (1849) p. 101. — Flor. Or. II, p. 291. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 67 no. 378. — Sickenberg. Contrib. Flor. d'Eg., p. 220. — *Astragalus tumidus* Willd. Act. Berol. 1794, p. 76 ex parte. — *Colutea spinosa* forsk. Flor. aeg.-arab., p. 131. — A shrubby plant, 20—50 cm high, shrubby, appressed-canescens; branches beset with stout, 3 cm long, spreading spines. Leaflets 4—5 pairs, those of the new branches remote; axillary leaves deciduous, ending in a minute prickle, leaflets crowded; the leaflets of both kinds of leaves obovate-oblong, muticous. Peduncles axillary, short, 1—2-flowered; calyx puberulent, tubular, in fruit ovate, about 40-nerved, teeth subulate. — Flow. February to March.

M. ma. Abusîr; Alexandria-West and -East on sandy hills; Mandara; Abukir, not common. — **D. i.** Es-Sâlihiya, in deep sandy places not common; Ismailia; Ramses-Station. — **D. a. sept.** Everywhere, a characteristic little bush on calcareous ground.

Local name: kedâd.

Also known from Arabia Petraea and Palestine.

748. (27.) **Astragalus cahiricus** DC. Prodrôm. II (1825), p. 292. — Boiss. Flor. Or. II, p. 420. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 67 no. 379. — Sickenberg. Contrib. Flor. d'Eg., p. 221. — Aschers. Flor. Rhinocol., p. 795 no. 105. — *Astragalus longiflorus* Del. Illustr. Flor. d'Eg., p. 112 tab. 39 not Pall. — *Astragalus isopetalus* Boiss. Diagnos. Plant. Orient., Ser. I fasc. IX p. 67. — An shrub, 50 cm to 1 m high, or sometimes more, woolly-canescens; stems thick, decumbent, zigzag. Stipules herbaceous, broad triangular, acute, 7 mm long, leaflets 5—9 pairs, orbicular, 2 cm long, often retuse, upper surface glabrous. Racemes axillary, rather loose, cylindrical, short peduncled; bracts 0; bracteoles awl-shaped, much shorter than the calyx-tube; calyx hirsute, in fruit bladdery-inflated, 2 cm long, teeth one-third as long as the tube; standard straight, twice as long as the calyx. — Flow. February to March.

M. p. Bîr-Abu-Elfeyn; Bîr-Mazar; El-^cArish. — **D. i.** Es-Sâlihiya; Ramses-Station; Nefish; Ismailia. — **D. a. sept.** Polygone; Great Petrified Forest near Cairo (Robert Koch); Wady Dugla; a characteristic plant of all the Wadies.

Local name: kedâd; zibb-el-quṭṭ (Ascherson).

Also known from Arabia Petræa and Palestine to Persia.

749. (28.) **Astragalus camelorum** Barb. Herboris. au Levant (1882), p. 131 tab. III. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 67 no. 380. — Sickenberg. Contrib. Flor. d'Eg., p. 221. — An perennial herb 20—30 cm high or more, stem shrubby. Stipules subconnate. oblong-ovate, ciliate, mucronate, 4 mm long; leaves 5—6 cm long; leaflets 2—4 pairs, conduplicate, oblong, 8 mm long, 2 mm broad, distant. Flowers 6 or more in a raceme, 1.2 cm long; peduncle almost 0; calyx white-and black-hairy, teeth one-fifth as long as tube, half as long as the pale, purplish-yellow, 3 cm long corolla; ovary oblong-ovoid. — Flow. March to May.

M. p. Bir Ba'uada-el-Mesa'id; El-Gels-el-Mohamedîya and Nakl-el-Hamrâ.

Also known from Palestine.

290. (24.) **Sesbania** Pers.

Calyx broadly campanulate, with short subequal teeth. Petals all distinctly unguiculate; standard large, emarginate orbicular; wings oblong; keel incurved, obtuse. Stamens diadelphous; anthers uniform or nearly so. Ovary sessile or short-stalked, multiovulate. style glabrous, incurved; stigma capitate. Pod linear, compressed, or terete or tetragonous or 4-winged, usually dehiscing. — Herbs or soft-wood shrubs of brief duration with very numerous leaflets and flowers in axillary racemes.

A small genus dispersed through the Tropics of both hemispheres, many of the species very closely allied and difficult to define.

A. Corolla 12—14 mm long.

I. Branches finely downy; lower pedicels 12 to

20 mm long 1. **S. cinerascens.**

II. Branches glabrous; lower pedicels 4—8 mm

long 2. **S. aegyptiaca.**

B. Corolla 8—10 mm long 3. **S. pubescens.**

750. (1.) **Sesbania cinerascens** Welw. in Oliv. Flor. Trop. Afr. II (1871), p. 134. — Sickenberg. Contrib. Flor. d'Eg., p. 219. — A graceful much branched slender shrub, 1.60—3 m high, with finely grey down branches. Petioles very short unarmed. Upper leaves 8—12 cm long; leaflets 15—20-jugate, reaching 18—20 mm long, glaucous, puberulous. Peduncles 2—5 cm. Racemes loosely 8—12-flowered, the lower pedicels 12—18 mm long, often cernuous. Calyx 4 mm deep; teeth very short, deltoid cuspidate. Corolla

2 cm deep, the standard 2 cm broad, copiously finely dotted with purple. Pod 18—25 cm long, 5½ mm thick, tipped with a persistent style half 2.5 cm long, the moderately thick valves slightly torulose, not at all ribbed on the back; seeds 40—50. — Flow. March.

N. d. Sharabas, in cotton-fields.

Also known from Tropical Africa.

751. (2.) **Sesbania aegyptiaca** Pers. Synops. II (1807), p. 316. — Boiss. Flor. Or. II, p. 193. DC. Prodrum. II, p. 264. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 65 no. 352. — Sickenberg. Contrib. Flor. d'Eg., p. 219. — *Sesbania picta* Pers. Bot. Reg., tab. 873. — An erect copiously branched pale-green glabrous shrub, 1—3 m high. Leaves nearly sessile, the unarmed rachis on the upper ones 2 to 9 cm long; leaflets 10—20-jugate, glabrous, glaucous-green, reaching 2.5 cm long, 5 mm broad, blunt with a faint mucro. Peduncles 2—5 cm; racemes lax, 6—12-flowered; pedicels spreading, 4—8 mm. Calyx 4 mm, glabrous, the teeth very short, deltoid cuspidate. Corolla bright yellow, 1 cm long, the round emarginate standard 1 cm broad, more or less dotted with purple. Pod 12—16 cm long, 2½ to 5 mm thick, distinctly torulose, 20—30-seeded, the valves rounded on the back. — Flow. February to March.

N. d. N. f. N. v. Everywhere cultivated and subsontaneous.

Local name: seysebân.

Extends through Tropical Asia to North Australia, and often cultivated in European gardens.

752. (3.) **Sesbania pubescens** DC. Prodrum. II (1825), p. 265. — Oliv. in Flor. Trop. Africa II, p. 135. — A firm erect annual reaching a height of 0.75—2 m with densely grey-silky branches. Leaves short-stalked, the upper ones 6—9 cm, the lower ones 16 to 25 cm long; leaflets 16—30-jugate, 22—35 mm long, 4—5 mm broad, densely grey-silky. Racemes 2½—5 cm long, 6—15-flowered on short silky peduncles. Pedicels 4—6 mm long. Calyx 5 mm, subglabrous, the deltoid teeth ⅓—¼ of the tube. Corolla 5 mm long. Pod 10—15 cm long, 2 mm thick, falcate, 20—30-seeded, not torulose when mature; valves thick, coriaceous. — Flow. March.

N. d. Shirbîn, in cotton-fields (G. Maire).

Also known from Nubia.

291. (25.) **Glycyrrhiza** Linn.

Calyx somewhat 2-lipped, upper teeth connate higher than the lower ones. Standard narrow, wings and keel acute. Stamens diadelphous, anthers somewhat 2-valved on account of cells joined

at the apex. Ovary many-ovuled, style glabrous, incurved at the apex; stigma terminal, capitate. Pod leathery, oblong to linear, flattened, or necklace-like, rarely ovate, turgid, not divided within, indehiscent or somewhat dehiscent. — Perennial, generally glandular herbs, with a sweet root, odd-pinnate leaves, axillary racemes or heads, and bluish or violet flowers.

A small genus, widely distributed in the Mediterranean region and Asia.

753. **Glycirrhiza glabra** L. Spec. Plant. I (1753), p. 1048. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 66 no. 353. — Boiss. Flor. Or. II. p. 202. — Sickenberg. Contrib. Flor. d'Eg., p. 219. — A tall perennial plant 50 cm to 1 m high or more, erect. Leaflets 4—7 pairs, oblong to elliptical-lanceolate, acute or obtuse; racemes loose, shorter than the leaves or a little longer; flowers 1 cm long; pods oblong to linear, 1—3 cm long, flattened, straightish. Flow. May and June. — A variable species growing in waste fields and on dry hillsides, crowding out other vegetation. Widely distributed. It furnishes the officinal Liquorice.

O. Siwa; Little Oasis; Farâfra; Dakhel; Great Oasis. — **N. d.** Cairo, naturalized abundantly in old gardens near the Palais Helmiyeh.

Local name: 'orqûs.

Also known from Asia to Persia. — The great underground root-stocks make excellent fuel even when green and moist; and from them is obtained a common house hold medicine, a coarse extract.

292. (26.) **Scorpiurus** Linn.

Calyx short bell-shaped, the upper teeth connate higher than the lower one. Petals yellow. Keel beaked. Pod circinnate, grooved and crested lengthwise more or less constricted between the seeds. Cotyledons contorted. — Annual herbs, with simple, oblong, spatulate leaves tapering into a petiole.

A small genus widely distributed in the Mediterranean region.

A. Pods with prickles 1. **S. sulcata**.

B. Pods without tubercles or smooth 2. **S. muricata**.

754. (1.) **Scorpiurus sulcata** L. Spec. Plant. I (1753), p. 1050. — Boiss. Flor. Or. II, p. 179. — Aschers. Flor. Rhinocol., p. 795 no. 92. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 754. — Sickenberg. Contrib. Flor. d'Eg., p. 218. — An annual erect herb, 20—40 cm high or more. Prickles of the outer ribs much shorter than the diameter of the pods; seed scarcely striate. — Flow. March to April.

M. p. El-'Arîsh.

Also known from Morocco, Tunisia, Algeria, Southern Europe, Palestine and Syria.

755. (2.) **Scorpiurus muricata** L. Spec. Plant. I (1753), p. 1050. — Boiss. Flor. Or. II, p. 178. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 64 no. 340. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 754. — Aschers. Flor. Rhinocol., p. 793 no. 91. — Sickenberg. Contrib. Flor. d'Eg., p. 218. — Sparingly hirtulous. Leaves oblong-spathulate, acute; peduncles long, 2—3-flowered; pods glabrous or sparingly puberulous, loosely circinnate; outer ribs with short tubercles. — Flow. March to April.

M. ma. Abusîr; Montaza; Alexandria-West and -East; Abukir. — **M. p.** El-'Arîsh, in deep sandy places; El-Grâdy. — **N. d.** Damanhur; Mansura; Mehallet-el-Kebîr; Tanta; Zaqazîq; Sâlihîya; Qalyub; Cairo, not common. — **N. f.** Medînet-el-Fayûm; Tamîa; Senuris; Senhûr; Bogîq; Kôm-Fâris; El-Hammâm. — **O.** Little Oasis; Dakhel; Great Oasis.

Local name: 'oreyd; lisân-el-kelb (Ascherson); wudeyneh; widneh.

Also known from all the other parts of the Mediterranean region.

var. **laevigata** (Sibth. and Smith) Boiss. in Flor. Or. II (1872), p. 178. — Icon. Moris. Oxon., tab. 2 fig. 2. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 64 no. 340a. — *Scorpiurus laevigata* Sibth. and Smith Flor. Graec., tab. 718. — Pods without any tubercles. — Flow. March to April.

O. Great Oasis.

Also known from Tunisia, Tripolitania, Greece and Spain.

293. (27.) **Hippocrepis** Linn.

Herbs or low shrubs, usually glabrous, with pinnate leaves and axillary peduncles, bearing an umbel of yellow flowers, without any leaf. Stamens diadelphous, the upper one quite free. Pod much flattened, of numerous articles, each of them curved like a horseshoe, so that the pod has as many deep notches on one side.

A genus of but few species, chiefly natives of south-western Europe. In flower they cannot well be distinguished from *Coronilla*, but the pod is very different.

A. Margins of sinus not ending in horns.

I. Glabrescent I. **H. unisiliquosa**.

II. Appressed hairy.

- a) 2-flowered 2. *H. bisiliqua*.
 b) 4—8-flowered.
 1. Sinus looking toward the convex
 margin of the pod.
 α) Calyx-lobes hairy 3. *H. multisiliquosa*.
 β) Calyx-lobes glabrous 4. *H. cyclocarpa*.
 2. Sinus looking toward the concave
 margin of the pod 5. *H. constricta*.
 B. Margins of sinus ending in more or less elongated,
 divergent horns 6. *H. bicontorta*.

756. (1.) **Hippocrepis unisiliquosa** L. Spec. Plant. I (1753), p. 1050. — Boiss. Flor. Or. II, p. 184. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 64 no. 341. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 754. — Aschers. Flor. Rhinocol., p. 795 no. 93. — *Hippocrepis monocarpa* MB. Flor. Taur.-Cauc. III, p. 480. — An annual herb. 20—40 cm high, glabrescent; stems decumbent, simple. Leaflets 4—7 pairs, wedge-oblong to linear, retuse. Flowers axillary, nearly sessile, single or rarely twin; pods straight, or slightly curved; rings of seeds more or less complete, more or less papillary or glabrous, sinus of seed looking toward concavity of the pod. — Flow. March to April.

M. ma. Mariut. — **M. p.** El-Grâdy.

Also known from the Mediterranean parts of Europe and Northern Africa.

757. (2.) **Hippocrepis bisiliqua** Forsk. Flor. aeg.-arab. (1775), p. LXXI no. 371. — Boiss. Flor. Or. II, p. 185. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 65 no. 342. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 754. — Sickenberg. Contrib. Flor. d'Eg., p. 219. — *Hippocrepis ciliata* Boiss. Flor. Or., Supplem. p. 171 partly not Willd. — *Hippocrepis biflora* Spreng. Syst., p. 702. — An annual herb. 20 to 40 cm high, sometimes somewhat more, sparingly appressed-hairy, decumbent. Leaflets 4—5 pairs, linear, truncate or retuse. Peduncles 2—5-flowered, about as long as the leaves; pods curved, scabrous-hairy at the seeds, sinus looking toward the concave margin of the pods. — Flow. March to April.

M. ma. Mariut; Alexandria-West and -East.

Also known from Arabia Petraea to Mesopotamia.

758. (3.) **Hippocrepis multisiliquosa** L. Spec. Plant. I (1753), p. 1050. — Boiss. Flor. Or. II, p. 185. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 65 no. 343. — Aschers.-Schweinf. Primit. Flor. Marmarie., p. 603 no. 101. — Murbeck Contrib. Flor. Nord-Ouest Afr. I, tab. 4 fig. 10—14. — An annual herb, 30—50 cm high, sparingly appressed-

hairy or glabrescent, decumbent. Leaflets 4—7 pairs, oblong-linear, often retuse. Peduncles 2—8-flowered, about as long as the leaves; pods strongly curved, sometimes circular, glabrous or scabrous-hairy at the seed, sinus completely closed, looking toward the convex margin of the pod. — Flow. March to May.

M. ma. Marmarica: Matruqa; Dakalla; Alexandria-West.

Also known from the Mediterranean parts of North-Africa and -Asia, Greece, Italy and Spain.

759. (4.) **Hippocrepis cyclocarpa** Murb. in Contrib. Flor. de la Tun. I (1897), p. 80. — An annual plant; stems branching from the base, 10—30 cm long or more, adscendent or decumbent, sparingly appressed-hairy. Leaflets 3—5 pairs; leaflets obovate or oblong or linear-cuneate, 6—14 mm long, 1.5—5 mm broad; stipules triangular-lanceolate. Peduncles 3—5-flowered. Calyx-tube campanulate, glabrous; calyx-lobes laciniate. Corolla yellow. Pods strongly curved, sometimes circular, glabrous or scabrous-hairy at seed; sinus completely closed, looking toward the convex margin of the pod. — Flow. March.

M. ma. Mariut-Brighi.

Also known from Tunisia and Tripolitania.

760. (5.) **Hippocrepis constricta** Kunze Pugill. Plant. Prim. (1838), p. 42. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 65 no. 344. — Sickenberg. Contrib. Flor. d'Eg., p. 218. — *Hippocrepis elegantula* Hochst. and *Hippocrepis ciliata* Boiss. Flor. Or. II, p. 185 ex parte not Willd. — An annual herb, sparingly appressed-hairy; stems decumbent. Leaves 4—5 pairs; leaflets linear truncate or retuse; peduncles 2—5-flowered as long as the leaf; pods curved, scabrous, small, sinus looking toward the concave margin of the pod. — Flow. March to April.

N. v. Mohammid near Erment. — **D. l.** Desert near Siut. — **D. a. mer.** Sherm Luliya; Wady Lekhuma.

Also known from the Mediterranean parts of Europe and Asia.

761. (6.) **Hippocrepis bicontorta** Loisl. Nouv. Not. (1827), p. 32. — Flor. Gall. II, p. 162 tab. 28. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 65 no. 345. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 754. — Sickenberg. Contrib. Flor. d'Eg., p. 218. — Aschers. Flor. Rhinocol., p. 795 no. 94. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 603 no. 102. — *Hippocrepis cornigera* Boiss. Diagn. Plant. Orient., Ser. I fasc. II p. 102. — Flor. Or. II, p. 185. — *Hippocrepis velutina* Del. Illustr. Flor. d'Eg., tab. 64. — Barbey Herbor. au Lev., tab. IX fig. 10. — *Hippocrepis buceras* Del. Ill. Flor. d'Eg., tab. 64 fig. 13. — An

annual herb, 20—30 cm high, sparingly appressed-hairy, decumbent. Leaflets 3—5 pairs, oblong to linear, retuse. Peduncles somewhat longer than leaf, 2—4-flowered; pods papillary-hairy or glabrescent, scorpioid, with one or two circular turns, sinus more or less closed, looking toward the convex margin of the pod. — Flow. March to April.

M. ma. Marmarica: Matruqa; Mariut; Alexandria-West and -East. — **M. p.** El-'Arish to Qatiya. — **D. i.** Gebel Ekhfên.

Local name: durreys.

Also known from Tunisia, Algeria and Arabia Petraea.

294. (28.) **Coronilla** Linn.

Calyx short-campanulate, upper teeth connate higher up than lower. Keel acute or beaked. Pod elongated, straight or curved, terete or tetragonal, somewhat constricted at the joints. — Shrubs or herbs, with odd-pinnate or ternate leaves.

A large genus, widely distributed in Europe and the Mediterranean region.

762. **Coronilla scorpioides** (L.) Koch Syn. Flor. German. ed. I. (1835), p. 188. — Boiss. Flor. Or. II, p. 183. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 754. — Aschers. Flor. Rhinocol., p. 795 no. 92. — Ornithopus scorpioides L. Spec. Plant. I, p. 1049. — Flor. Graec., tab. 715. — Arthrolobium scorpioides DC. Prodrum. II, p. 214. — An annual herb, glabrous, glaucous, central stem erect, the lateral ones patent; stipules connected to one bidentate leaf; leaflets three, fleshy, the lateral orbiculate, the terminal large, ovate, shortly petiolate; peduncles 2—4-flowered, as long as the flower; flowers yellow, small; pods patent, curved, tetragonous-subcompressed. — Flow. February to March.

M. p. El-'Arish; el-Grâdy.

Also known from the Mediterranean parts of Europe.

295. (29.) **Hedysarum** Linn.

Calyx campanulate, 5-toothed. Standard narrow at the base; wings short or elongated; keel obliquely truncate at the base. Vexillar stamen free. Ovary many ovuled; style filiform; stigma somewhat sessile. Pod flattened, jointed, crenate at sutures, joints several, rarely by abortion 1, nearly round or quadrate, indehiscent. — Shrubs or herbs, with odd-pinnate leaves and flowers in axillary, peduncled racemes or spikes.

A large genus in Southern Europe and the Mediterranean region.

- A. Stipules free, lateral. Pods armed with hooked prickles 1. *H. spinosissimum*.
 B. Stipules unite, opposite the leaf. Pods unarmed or with short prickles 2. *H. coronarium*.

763. (1.) **Hedysarum spinosissimum** Sibth. and Smith Flor. Graec. I (1806), p. 453. — Boiss. Flor. Or. II. p. 513. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 67 no. 382. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 755. — Aschers. Flor. Rhinocol., p. 795 no. 106. — *Hedysarum capitatum* β *pallens* Moris Flor. Sard., tab. 68 fig. B. — *Hedysarum pallens* Hal. Consp. Flor. graec. I, p. 453. — An annual plant, 20–30 cm high or more, appressed-pubescent, decumbent. Leaflets 4–7 pairs, glabrous on upper, pubescent on lower surface, obovate to oblong-elliptical, 5 mm to 1 cm long, truncate or retuse. Peduncles longer than the leaf; flowers 2–8, racemed-capitate, pink; joints of the pod round, 6 mm in diameter, densely pubescent. — Flow. March to April.

M. ma. Alexandria-West and -East. — **M. p.** Damietta; El-Grâdy.

Also known from the other parts of the Mediterranean region.

764. (2.) **Hedysarum coronarium** L. Spec. Plant. I (1753), p. 1051. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 67 no. 383. — A perennial plant, 30–60 cm high, sparingly appressed-hairy, pale green, ascending, branched. Leaflets 5–6 pairs, green, fleshy, ovate to oblong, obtuse, 2 cm long, 8 mm broad, glabrescent on the upper, sparingly appressed-bristly on the lower surface. Peduncles somewhat longer than leaf; racemes dense, ovate, at length elongated; corolla purple, 1.5 cm long; joints of pod 2–3, round-ovate, slightly netted-wrinkled, wrinkles thicker toward the margin, short-hairy. — Flow. March to April, recently introduced.

M. ma. Ramle.

Also known from Southern Europe.

296. (30.) **Onobrychis** Linn.

Calyx-teeth subulate. Standard obovate, narrowed at the base, scarcely unguiculate; wings small; keel obtuse, equalling or longer than the standard. Upper stamen free at the base, connate with the others at the middle in a closed tube; anthers uniform. Ovary sessile, 1–2-ovulate. Style filiform, inflexed, with a small terminal stigma. Pod subcompressed, half or quite orbicular, inarticulated, indehiscent; seeds 1–2. — Herbs or undershrubs.

A large genus, principally Mediterranean.

A. Annuals.

I. Corolla as long as the calyx; pale pink . . . 1. *O. Crista galli*.II. Corolla longer than the calyx; deep pink . . . 2. *O. Gaertneriana*.B. Perennial; corolla yellow 3. *O. ptolemaica*.

765. (1.) ***Onobrychis Crista galli*** Lam. Flor. Franç. II (1778). p. 652. — Boiss. Fl. Or. II, p. 528. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 67 no. 384. — Aschers.-Schweinf. Ill. Flor. d'Eg. Supplem., p. 755. — Sickenberg. Contrib. Flor. d'Eg., p. 221. — Aschers. Flow. Rhinocol., p. 795 no. 107. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 603 no. 111. — Hedysarum Crista Galli L. System., p. 563. — An annual plant, 20—40 cm high, appressed-canescient, diffuse or ascending. Leaflets 5—10 pairs, oblong-cuneate to obovate-oblong, retuse to obcordate, mucronate. Peduncles 1—3-flowered, somewhat shorter than the leaf; calyx-teeth about as long as pale pink corolla; pod hairy, semi-orbicular, 1.5 cm long, with pitted and usually prickly disk, and crest divided into 3—4, lanceolate, acute, toothed lobes, often furnished on both sides with an accessory crest, with shorter lobes. — Flow. March to April.

M. ma. Marmarica; Matruqa; Abusir; Mariut; Alexandria-West and -East. — **M. p.** El-Grâdy; El-'Arish.

Local name: durreys (Ascherson); ssimret-el-ajûn (Schweinfurth.)

Also known from Morocco, Algeria, Tunisia, Tripolitania, Palestine, Syria and Greece.

766. (2.) ***Onobrychis Gaertneriana*** Boiss. Diagnos. Plant. Orient., Ser. I fasc. IX (1849), p. 108. — Flor. Or. II, p. 528. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 67 no. 385. — Aschers. Flor. Rhinocol., p. 795 no. 107. — *Onobrychis Crista Galli* Gaertn. de Fruct. II tab. 148 and DC. Prodom. not. Linn. — Hedysarum Crista Galli, Russ. Alepp., tab. 12. — *Onobrychis squarrosa* Viv. Dec. Plant. aeg. no. 13. — *Onobrychis Crista Galli* var. *Gaertneriana* Post Flor. Syr. Sin. and Palest., p. 281. — An annual plant, 20—50 cm high, appressed-canescient, diffuse or ascending. Leaflets 5—10 pairs, oblong-cuneate to obovate-oblong, retuse to obcordate, mucronate. Peduncles 1—3-flowered, somewhat shorter than the leaf; corolla deep pink, a little longer than the calyx; pod hairy, semi-orbicular, 2 cm long, with pitted and usually prickly disk, and crest divided into 3—4 toothed lobes, often furnished on both sides with an accessory crest, with shorter lobes. — Flow. March to April.

M. ma. Alexandria-East.

Also known from Syria and Palestine.

767. (3.) ***Onobrychis ptolemaica*** (Del.) DC. Prodom. II (1825). p. 347. — Boiss. Flor. Or. II, p. 547. — Aschers.-Schweinf. Ill. Flor.

d'Eg., p. 67 no. 386. — Sickenberg. Contrib. Flor. d'Eg., p. 221. — Hedysarum ptolemaicum Del. Illustr. Flor. d'Eg., p. 328 tab. 39 fig. 1. — An perennial herb, 10—25 cm high, or more, villous; stems ascending from the neck. Leaflets 4—8 pairs, oblong to elliptical, glabrous at the upper, loosely hirsute at the lower surface. Racemes long, many flowered; corolla yellow, 1.5 cm long, rusty-lined; wing not longer than the calyx-tube, horse-shoe-shaped; pod 1 cm long, 7 mm broad, densely woolly, pitted and short-prickly at the disk and margin. — Flow. February to March.

D. a. sept. Wady Hammâta; Wady Dugla near Helwân.

Local name: khanser-el-darusâh (Wilkinson).

Also known from Arabia Petraea and Palestine.

297. (31.) **Taverniera** DC.

Calyx with a campanulate tube and five subequal teeth. Standard obovate-cuneate; wings small; keel as long as the standard, obliquely truncate at the apex. Upper stamen free at the base or altogether; anthers uniform. Ovary stalked. 1—3-ovulate; style filiform, inflexed; stigma terminal. Pod flattened, composed of 1—3 indehiscent 1-seeded joints. — Shrubs with carnosio-herbaceous deciduous simple or pinnately trifoliate leaves and marcescent flowers.

A desert genus extending from Egypt and Abyssinia to the North-west of India.

768. **Taverniera aegyptiaca** Boiss. Diagnos. Plant. Or., Ser. I fasc. IX (1849) p. 113. — Flor. Or. II, p. 509. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 67 no. 381. — An excessively branched low shrub with slender virgate subglabrous twigs. Leaves all simple, obovate-cuneate, subglabrous, 4—8 mm long, on slender petioles under 2 mm long. Flowers 1—2 together on an axillary silky peduncle 8 mm long. Pedicel very short, finely silky. Calyx $2\frac{1}{2}$ —5 mm deep, subglabrous, the linear teeth equalling the tube. Corolla red, 10 mm deep, the standard 8 mm broad. Pod shortly stipitate, 8—12 mm long, 8 mm broad, with 2—3 joints densely bristly on the faces.

D. a. sept. Suez; Northern and Southern Galala. — **D. a. mer.** Râs Mreyk; Wady Lekhuma.

Local name: dehasîr (Schweinfurth).

Also known from Nubia.

298. (32.) **Ebenus** Linn.

Calyx campanulate-tubulose with 5 plumose teeth sometimes longer than the tube. Standard obovate or obcordate, keel truncate at the tip, obtuse. Vexillar stamen connate with the other. Ovary 1- or rarely 2—3-ovulate; style filiform, incurved; stigma small, terminal. Pod enclosed by the calyx, compressed, membranous, sparingly hairy, rarely reticulate and glabrous, indehiscent, 1- or rarely 2-seeded. — Herbs or often shrubs, silky-pubescent or villous; leaves impari pinnate or the lower ones trifoliate, rarely unifoliate; flowers capitate or spicate.

A small genus widely dispersed in the Mediterranean region.

769. **Ebenus Armitagei** Schweinfurth and Taubert in Bull. l'Herb. Boiss. I (1893), p. 645. — Shrub, branched from the base; young branches and peduncles silky-tomentous or subvillous; stipules amplexicaul at the base, broadly ovate, emarginate at the tip, rarely subtruncate, bidentate, often tridentate, at last scarious; leaves narrowed, shortly petiolate, digitate trifoliate; leaflets shortly petiolate, obovate or oblanceolate, mucronate at the tip, at the base-cuneate, pubescent at the upper surface, appressed hairy at the lower surface; inflorescence spicate, appressed silky-hairy, 2—4-times longer than the leaf, loose; bractlets concave, broadly ovate, cuspidate, densely sericeous, firstly herbaceous, then scarious; flowers sessile; calyx long villous, teeth subulate thrice as long as the tube; corolla glabrous thrice shorter than the calyx; standard pink broadly orbiculate; keel (and wings) white falcate-ovate, curvate at the margin; ovary globose villous; style glabrous; pods not seen. — Flow. March.

M. ma. Marmarica; Matruqa.

Also known from Western Marmarica.

299. (33.) **Alhagi** Tourn.

Calyx campanulate, the teeth very short, subequal. Petals equal; standard obovate, shortly clawed; keel incurved, obtuse. Upper stamen free; filaments filiform; anthers uniform. Ovary subsessile, multi-ovulate; style filiform, incurved, glabrous, stigma terminal. Pod linear, subterete, smooth, indehiscent, many-seeded, contracted and septate between the seeds, the articulations not separating spontaneously. — Rigid, much-branched, spiny shrubs, with simple leaves.

A small desert genus, extending eastward to Hongaria and N.W. India.

770. **Alhagi Maurorum** Medic. in Vorles. d. Kurpfaelz. phys. oeconom. Gesellsch. II (1787), p. 397. — DC. Prodrum. II, p. 352.

— Boiss. Flor. Or. II. p. 558. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 67 no. 387. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 755. — Sickenberg. Contrib. Flor. d'Eg., p. 219. — Aschers.-Schweinf. Primit. Flor. Marmarie., p. 646 no. 113. — Aschers. Flor. Rhinocol., p. 796 no. 108. — Alhagi mannifera Desv. Journ. Bot. I, p. 120. — Hedysarum Alhagi L. Spec. Plant., p. 1051 ex parte. — An erect wiry much-branched glabrous shrub, 30—90 cm high, armed with copious pungent spreading spines 2,5 cm or more long. Leaves simple, drooping form the base of the spines and branches, obovate-oblong, entire, 2—6 mm long, short-stalked, deciduous. Flowers solitary or in few-flowered secund racemes from the spines on short pedicels. Calyx 8 mm deep, the teeth deltoid, acute. Corolla red, three times the calyx. Pod sickle-shaped, 2,5 cm or more long. — Flow. March to April.

M. ma. M. p. N. d. N. f. N. v. O. D. l. D. i. D. a. sept. Everywhere in deep sand common.

Local name: aqûl.

Also known from all the other parts of the Mediterranean North Africa. A very common shrub, from 90 cm to 1,50 m in height, on open places in gravelly and sandy soil, frequently growing gregariously. A very valuable fodder for camels and which in certain localities depending much on the season, yields a manna which is collected in Arabia for local use, as well as for exportation.

300. (34.) **Arachis** Linn.

Calyx-tube filiform, the lobes membranous, the four upper ones connate, the lowest thin, distinct. Petals and stamens inserted into the apex of the tube; standard suborbicular; wings oblong, free; keel incurved, rostrate. Stamens all connate in a closed tube, sometimes nine only; anthers alternately longer and shorter, fixed near the base and versatile. Ovary sessile at the base of the tube, 2—3-ovulate, the torus after the flower falls becoming an elongated, deflexed, rigid stalk forcing the fruit into the ground, the apex acute, and after the style falls terminated by a stigma-like callus; style long, filiform; stigma minute, terminal. Pod ripening beneath the soil, oblong, reticulated, indehiscent, subtorulose, but not articulated, continuous within. Seeds 1—3, irregularly ovoid. — Low, often prostrate herbs.

A small genus of the Tropics, chiefly in Brazil.

771. **Arachis hypogaea** L. Spec. Plant. I (1753), p. 1040. — DC. Prodrum. II, p. 474. — Oliv. Flor. Trop. Africa II, p. 158. — Lam. Illustr., tab. 615. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem.

p. 755. — Stems 30—60 cm long, herbaceous, diffuse, the branches clothed especially above with spreading hairs. Stipules 2.5 cm deep, the lower half adnate, the points lanceolate. Petioles 2 to 4½ cm long, silky. Leaflets in two pairs without a terminal one, obovate, 2—4½ cm long by more than half as broad. Flowers axillary, solitary, on long slender pedicels, only the lower ones fertile. Pod 2.5 cm long by half as thick. — Flow. March.

N. d. N. v. Often cultivated and sometimes subspontaneous.

Local name: fûl sudâny.

Cultivated as an article of food, as it is everywhere in the Tropics. It is probably a native of Brazil, to which the six other species of the genus belong exclusively. It is eaten roasted, boiled or converted into an oil.

301. (35.) *Cicer* L.

Calyx-tube oblique, the teeth long, subequal. Standard ovate or suborbicular, narrowed into a broad claw; wings obliquely obovate, free; keel broadish, incurved, obtuse or subacute. Upper stamen free; anthers uniform. Ovary sessile, bi- or multiovulate; style filiform, inflexed, beardless; stigma terminal. Pod sessile, oblong, turgid, 2-valved. — Viscous annual herbs with the petiole ending in a tendril.

A small genus belonging principally to Western Asia.

772. ***Cicer arietinum*** L. Spec. Plant. I (1753), p. 1040. — DC. Prodrum. II, p. 384. — Boiss. Flor. Or. II, p. 560. — Aschers.-Schweinf. III. Flor. d'Eg., p. 68 no. 388. — Sickenberg. Contrib. Flor. d'Eg., p. 222. Desf. Flor. Atlant. II, p. 168. — Lam. Illustr., tab. 615. — *Cicer cuneatum* Hochst. in Schimp. Herb. Abyss., no. 810. — Stems annual, 25—36 cm high, pubescent. Stipules flabellately cut nearly to the base. Leaflets 12—16, oblanceolate-cuneate, deeply inciso-dentate, subcoriaceous, viscous and prominently veined. Peduncles solitary, axillary, 16—20 mm long, geniculate and bracteolate. Calyx 5—6 mm deep, cut down nearly to the base, viscous, the teeth linear. Corolla purplish, the roundish standard exceeding and the wings about equalling the calyx. Pod oblong, 18—20 mm long, about half as broad, finely silky. — Flow. March to April.

N. v. Cultivated everywhere in Upper Egypt.

Local name: melâneh; the seed: hommus.

Also known from all the other parts of the Mediterranean region and the Tropics.

302. (36.) **Vicia** Linn.

Calyx-tube oblique, the teeth subequal. Standard obovate, narrowed into a broad claw; keel shorter than the wings. Stamens usually diadelphous, the sheath with a very oblique mouth. Ovary subsessile or stipitate. bi- or multiovulate; style inflexed, filiform or slightly flattened. bearded at the apex or pubescent throughout. Pod compressed, 2-valved, 2- or many-seeded. — Herbs with equally pinnate leaves ending in twining tendrils.

A large genus, spread over the temperate regions of both hemispheres.

A. Flowers 1—2, sessile in axils, rarely racemed.

I. Pod not denticulate at the sutures. Leaves tendril bearing.

a) Hilus of the seed opposite the radicle . 1. **V. lutea**.

b) Hilus of the seed near the radicle.

1. Seeds smooth 2. **V. sativa**.

2. Seeds tubercled 3. **V. peregrina**.

II. Pod denticulate at the sutures. Lower leaves

destitute of tendrils 4. **V. narbonensis**.

B. Flowers racemes, more or less long peduncled.

I. Style flattened; racemes many-flowered.

a) Leaflets linear-oblong.

a) Leaflets acute 5. **V. calcarata**.

β) Leaflets obtuse 6. **V. varia**.

b) Leaflets ovate 7. **V. salaminia**.

II. Style filiform; racemes 2—6 flowered.

a) Appressed-puberulent 8. **V. ervilia**.

b) Glabrescent 9. **V. gracilis**.

773. (1.) **Vicia lutea** L. Spec. Plant. I (1753), p. 1037. — var. **hirta** Boiss. Flor. Or. II (1872), p. 570. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 68 no. 389. — Sickenberg. Contrib. Flor. d'Eg., p. 221. Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 755. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 646 no. 114. — An annual plant. 15—30 cm high, or more, hairy, stems weak, ascending. Leaflets 6--8 pairs, oblong-linear to linear, obtuse, mucronate; stipules minute, obtriangular, 2-parted. Flowers solitary, rarely twin. corolla yellow or purplish, 1.5—2 cm long; pod stipitate, flattened, oblong-rhombic, 3 cm long, hirsute with hairs arising from a well-marked tubercle. — Flow. March to April.

M. ma. Marmarica: Matruqa; Mariut; Alexandria-East and -West. — **N. d. N. v.** Everywhere abundantly.

Local name: bakhrâ (Forsk.).

Also known from all the other parts of the Mediterranean region and Middle Europe.

var. **purpurascens** Koch. in Synop. Deutsch. Flor. (1847), p. 713.
— Flowers purple-violet.

N. d. Zaqaziq, cultivated abundantly.

Also known from Middle Europe.

774. (2.) **Vicia sativa** L. Spec. Plant. I (1753). p. 1037. — Boiss. Flor. Or. II, p. 574. — Flor. Dan., tab. 522. — Aschers.-Schweinf. III. Flor. d'Eg., p. 68 no. 390. — Aschers.-Schweinf. III. Flor. d'Eg., p. 755. — Sickenberg. Contrib. Flor. d'Eg., p. 221. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 646 no. 114. — *Vicia sativa* var. *genuina* Alef. Landwirtsch. Flor., p. 60. — A slender glabrous annual 12—20 cm high. Stipules semi-sagittate, deeply toothed. Leaflets in 3—4 pairs, linear-oblong, 12—20 mm long, retuse and mucronate. Flowers solitary, nearly sessile. Calyx glabrous, 5—9 mm long, the teeth linear. Corolla pale, half as long again as the calyx. Pod linear, 30—40 mm long, 8 mm broad, slightly upcurved, 6—8-seeded. — Flow. March to April.

M. ma. N. d. N. f. N. v. Cultivated everywhere abundantly.

Local name: fûl rûmy (Forsk.); dehorag (Del.); bakhrû (Barh.); besillet iblis (Ascherson).

Indigenous in the Mediterranean region. Cultivated everywhere in the temperate and tropical region of both the Old and New World.

var. **angustifolia** (L.) Alef. in Landwirtsch. Flor. (1866). p. 60. — Aschers.-Schweinf. III. Flor. d'Eg., p. 68 no. 390. — Sickenberg. Contrib. Flor. d'Eg., p. 221. — Aschers. Flor. Rhinocol., p. 796 no. 109. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 646 no. 115. — *Vicia angustifolia* L. Amoen IV, p. 105. — All. Flor. Podem. II, p. 108. — Boiss. Fl. Or. II, p. 574. — Sparingly pubescent, erect or climbing; leaflets 4—7 pairs, the lower one obovate, retuse, the others oblong-linear; stipules semi-hastate. — Flow. March.

M. ma. M. p. N. d. N. f. N. v. O. D. i. Everywhere cultivated abundantly.

Also known from the other parts of the Mediterranean region.

var. **cordata** (Wulf.) Alef. in Landwirtsch. Flor., p. 60. — Aschers.-Schweinf. III. Flor. d'Eg., p. 68 no. 390. — Sickenberg. Contrib. Flor. d'Eg., p. 221. — *Vicia angustifolia* β *cordata* Boiss. II, p. 575. — Some or all of the leaflets obcordate or obcuneate. — Flow. March to April.

M. ma. Alexandria. — **O.** Dakhel.

Also known from Syria and Palestine.

var. **amphicarpa** (L.) Coss. and Kral. Bull. Soc. Bot. France IV (1857), p. 40. — Boiss. Flor. Or. II (1872), p. 575. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 68 no. 390. — *Vicia angustifolia* δ amphicarpa Alef. Botan. Zeitg. XX (1862), p. 363. — Sickenberg. Contrib. Flor. d'Eg., p. 221. — *Vicia amphicarpa* L. Spec. Plant. ed. II, p. 1030. — Leaflets cuneate to linear. Some of the branches bearing underground flowers without corollas, and white, often ovate, 1-seeded pods. — Flow. March to April.

M. ma. Mariut.

Also known from the other parts of the Mediterranean region.

775. (3.) **Vicia peregrina** L. Spec. Plant. I (1753), p. 1038. — Boiss. Flor. Or. II, p. 576. — Cus. and Ansb. Herb. Flor. Fr., tab. 1219. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 756. — Sickenberg. Contrib. Flor. d'Eg., p. 221. — Aschers. Flor. Rhinocol., p. 796 no. 110. — Aschers.-Schweinf. Primit. Flor. Marmarie., p. 646 no. 116. — An annual plant, 20—40 cm high, sometimes somewhat more, appressed-puberulent; stems slender, procumbent or erect. Leaflets 3—5 pairs, linear, tapering at the base, truncate or retuse, mucronulate; stipules minute, obtriangular, 2-parted into subulate divisions. Peduncles 1-flowered; corolla purple, 1.5—2 cm long; pods stipitate, flattened, appressed-hairy, oblong, 3 cm long, 6 mm broad, short-beaked. — Flow. March to April.

M. p. El-'Arish; Wady: El-Grâdy.

Local name: djelbân (Ascherson).

Also known from all the other parts of the Mediterranean region and Middle Europe.

776. (4.) **Vicia narbonensis** L. Spec. Plant. I (1753), p. 1035. — Boiss. Flor. Or. II, p. 577. — Aschers. Flor. Rhinocol., p. 796 no. 111. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 68 no. 391. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 755. — Sickenberg. Contrib. Flor. d'Eg., p. 221. — An annual herb, 30—40 cm high, pubescent; stem thick, simple. Lower leaves of one pair of large, obovate leaflets, upper of 2—3 pairs, elliptical, entire; stipules large, semi-orbicular, dentate. Peduncles 1—2-flowered, very short; corolla purplish-violet; pods glabrous, oblong, 4 cm long, 1 cm broad, beak short, incurved. — Flow. March to April.

M. ma. Alexandria-West and -East. — **M. p.** El-Grâdy. — **N. d. N. f.** Abundant on alluvial ground. — **O.** Little Oasis; Farâfra.

Local name: bakher.

Also known from Southern Europe and the Orient.

var. **aegyptiaca** Koernicke in Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. (1889) p. 756. — Seeds large, 1—1.3 cm broad, pale yellow or brown; pods glabrous; leaflets entire; corolla purple-violet. — Flow. March.

N. d. Zaqaziq (Schweinfurth).

Only known from this locality.

var. **affinis** Koernicke in Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. (1889) p. 756. — *Aracus Fabaceus* and *Faba Kayrina* Joh. Baubin Hist. plant., p. 286 (??). — Seeds only 6 mm broad, ingrescent; pods glabrous; leaflets entire or paucidentate as the tip; corolla purple-violet. — Flow. March.

N. d. Zaqaziq (Schweinfurth).

Only known from this locality.

777. (5.) **Vicia calcarata** Desf. Flor. Atlant. II (1798), p. 166. — Boiss. Flor. Or. II, p. 590. — Aschers. Flor. Rhinocol., p. 796 no. 112. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 68 no. 392. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 646 no. 117. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 756. — Sickenberg. Contrib. Flor. d'Eg., p. 221. — An annual herb, 30—60 cm high or more, sparingly pubescent, ascending or erect, often rather rigid. Leaflets 5—8 pairs, linear-oblong to linear, obtuse; stipules small, semi-hastate, 2-parted. Racemes shorter than the leaf, 4—10-flowered; corolla pale violet; pods short-stipitate, glabrous, flattened, oblong, 4 cm long, 1 cm broad, beak short, curved. — Flow. March to April.

M. ma. Marmarica: Matruqa; Dakalla; Mariut: Alexandria-West and -East; Abukîr. — **M. p.** Qatiya to El-Arish. — **N. d. N. f. N. v.** Everywhere abundantly on gravelly soil. — **O.** Little Oasis: Farâfra; Dakhel; Great Oasis. — **D. i.** Es-Salihîya; Ismailia.

Local name: kharig (Schweinfurth); dikhreyg (Ascherson); bakher (Schweinfurth); gilbân (Ascherson); djilbân (Ascherson).

Also known from Morocco, Algeria, Tunisia, Tripolitania, Spain, Syria and Palestine.

778. (6.) **Vicia varia** Host. Austr. II (1831), p. 232. — Boiss. Flor. Or. II, p. 590. — *Vicia villosa* var. *glabrescens* Koch-Synops., p. 713. — *Vicia dasycarpa* Ten. Syll., p. 358. — An annual or biennial herb, 30—50 cm high, appressed-hirsute, prostrate or climbing. Leaflets 6—8 pairs, linear-oblong to linear, obtuse or acute. Racemes many-flowered, longer than leaf; corolla violet, .015 long; pods long-stipitate, oblong-rhombic, 2—3 cm long, 8 mm to 1 cm broad, short-beaked. — Flow. March to April.

M. ma. Mariut; Alexandria.

Also known from Europe.

779. (7.) **Vicia salaminia** Heldr. and Sart. in Boiss. Diagnos. Plant. Orient., Ser. II fasc. 2 (1853) p. 39. — Flor. Or. II, p. 591. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 756. — Sickenberg. Contrib. Flor. d'Eg., p. 221. — An biennial plant; appressed hirsute; stems scandent; leaves 5—7 pairs; leaflets ovate or oblong-elliptical, obtuse; stipules semisagittate, lanceolate, the upper-ones often stipitate; racemes loose longer as the leaves; calyx thrice as short as the violet-blue corolla; calyx-teeth lanceolate-subulate, the lowest as long as the tube; pod linear-rhombic, appressed hirtulous; seeds globose-compressed, black. — Flow. March.

M. ma. Mariut; Alexandria (Blandenier ex Sick.).

Also known from Greece and the Orient.

780. (8.) **Vicia Ervilia** (L.) Willd. Spec. Plant. III (1800), p. 1103. — Boiss. Flor. Or. II, p. 595. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 68 no. 393. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 756. *Ervum Ervilia* L. Spec. Plant. I, p. 1040. — An annual plant, 20 to 40 cm high, or sometimes more, appressed-pubescent; stems erect, firm. Leaflets 8—12 pairs, oblong, retuse; stipules semi-hastate, incised-dentate. Peduncles 2—4-flowered, mucronate, shorter than leaf; corolla violet, 1 cm long, striate; pod oblong-linear, 2 cm long, 5 mm broad, 3—4-seeded, torulose. — Flow. March to April.

M. ma. Alexandria, probably recently introduced. It is cultivated as a forage plant.

Local name: kursene.

Also known from Europe and the Orient.

781. (9.) **Vicia gracilis** Loisel. Flor. Gall. (1806—1807), p. 460 tab. 12. — Boiss. Flor. Or. II, p. 596. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 68 no. 394. — Sickenberg. Contrib. Flor. d'Eg., p. 222. — *Ervum gracile* DC. Catal. Hort. Monspel., p. 109. — An annual herb, 30—40 cm high, sometimes more, glabrescent, slender, ascending or climbing. Leaflets 3—4 pairs, oblong-elliptical to linear, acute or obtuse; stipules semi-hastate, entire. Peduncles filiform, 2—5-flowered, aristate, twice as long as the leaf; calyx less than half as long as the bluish, 7 mm long corolla; pods linear, 1.5 cm long, 3 mm broad, 5—6-seeded. — Flow. March to April.

N. f. Medînet-el-Fayûm (Defflers).

Also known from Morocco, Algeria, Tunisia, Tripolitania, Central and Middle Europe and Asia Minor.

303. (37.) **Lens** Linn.

Calyx-teeth long, nearly equal. Standard obovate. Wings adherent to the keel. Mouth of the staminal tube oblique. Upper

margin of the style flattened at the back, and bearded, lower smooth. Pod flattened, short, 1—2-seeded. — Small flowered annuals, differing from the small flowered *Viciae* only in the style. Flowers less than 1 cm long. — Annual or biennial herbs.

A small genus widely distributed in Europe and the Mediterranean region.

782. *Lens esculenta* Moench Method. (1794), p. 131. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 68 no. 395. — Sickenberg. Contrib. Flor. d'Eg., p. 222. — *Ervum* *Lens* L. Spec. Plant., p. 1039. — Boiss. Flor. Or. II, p. 598. — Schenk. Handb., tab. 102. — An annual plant. 30 cm high, pubescent, erect. Upper leaves tendrill-bearing; leaflets 5—6 pairs, oblong to oblong-linear; stipules lanceolate entire. Peduncles 1—4-flowered, aristate, about as long as the leaf; calyx-teeth subulate, as long as the white, violet-striped corolla; pod ovate-rhombic, 1 cm long, 1 mm broad, seeds lenticular. — Flow. December to April.

M. ma. M. p. N. d. N. f. N. v. O. D. l. D. i. D. a. sept. D. a. mer. Cultivated abundantly for its nutritious seeds.

Local name: 'ads; sargam (Dongola).

Also known from all the other parts of the Mediterranean region and Europe.

304. (38.) *Lathyrus* Linn.

Calyx-tube oblique, the upper teeth shorter. Standard orbicular, shortly unguiculate; keel incurved, obtuse. Stamens monadelphous or diadelphous, the mouth of the sheath not oblique. Ovary sessile (rarely stipitate) multiovulate; style inflexed, flattened vertically upwards, bearded on the inner face. Pod compressed or subterete, two-valved, continuous within, many-seeded. — Herbs with the petiole in all our species extending into a clasping tendril.

A large genus, with a geographical range like that of *Vicia*.

A. Only the upper petioles bearing leaflets . . . 1. *L. Aphaca*.

B. All the petioles bearing one pair of leaflets.

I. Pods glabrous or slightly hairy.

a) Peduncles as long as the leaf . . . 2. *L. Gorgonii*.

b) Peduncles shorter than the leaf.

1. Corolla yellow 3. *L. annuus*.

2. Corolla yellowish-pink 4. *L. hierosolymitanus*.

3. Corolla red or reddish.

a) Stipules lanceolate-subulate . . . 5. *L. sphaericus*.

β) Stipules lanceolate-oblong . . . 6. *L. Cicer*.

4. Corolla pale violet-pink 7. *L. marmoratus*.

5. Corolla bluish-pink or whitish . . . 8. *L. sativus*.

II. Pods ciliate 9. *L. hirsutus*.

783. (1.) **Lathyrus Aphaca** L. Spec. Plant. I (1753), p. 1029. — Boiss. Flor. Or. II, p. 602. — Rechb. Ic. XXII, tab. 197 fig. 1—3. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 68 no. 396. — Aschers.-Schweinf. Ill. Flor. d'Eg. Supplem., p. 756. — Sickenberg. Contrib. Flor. d'Eg., p. 221. — Aschers. Flor. Rhinocol., p. 196 no. 113. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 647 no. 118. — An annual plant, 30—60 cm high or sometimes more, glaucescent; stems flaccid, prostrate or ascending, angled. Stipules often 2 cm long, 1.4 cm broad, ovate, truncate at the base, 2-aureoled. Peduncles 1-flowered, longer than the tendril; corolla yellow; pod linear, 3 cm long, 5 mm broad, somewhat falcate, netted-veined; seeds uniformly brown. — Flow. March to April.

M. ma. Marmarica: Matruqa; Mariut; Alexandria-West and -East. — **M. p.** Qatiya to el-'Arish. — **N. d. N. f.** Menshiyet Abdalla (Virchow). — **N. v.** Everywhere abundantly. — **O.** Little Oasis; Farâfra; Dakhel; Great Oasis.

Local name: hamâm-el-burg (Ascherson).

Also known from all the other parts of the Mediterranean region and Europe.

784. (2.) **Lathyrus Gorgonii** Parl. ap. Sommer in Bull. Soc. Bot. Ital. Juni 1909, p. 126. — Lathyrus amoenus Fenzl Russegg. Reis. I, p. 890 tab. 2 and Pug. Plant. nov. Syr. 3. — Boiss. Flor. Or. II, p. 605. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 69 no. 400. — An annual herb, 20—60 cm high or more, stems diffuse or climbing, winged. Stipules semi-sagittate, oblong-lanceolate, usually a little longer than the petiole. Peduncles 1-flowered, about as long as the leaf; corolla reddish-yellow; calyx-lobes twice as long as the tube, 2—2.5 cm long; pod 2.5—4 cm long, 8—10 mm broad, upper margin straightish, flattened, 3-keeled; seeds 5—8, glabrous. — Flow. March to April.

M. p. Qatiya.

Also known from Sardinia, Sicily, Malta, Cyrenaica, Palestine, Syria, Asia Minor, Babylonia and Persia.

785. (3.) **Lathyrus annuus** L. Spec. Plant. I (1753), p. 1032. — Boiss. Flor. Or. II, p. 603. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 69 no. 398. — Sickenberg. Contrib. Flor. d'Eg., p. 221. — An annual plant, 30—60 cm high, narrowly winged upwards. Leaves with a single pair of linear or linear-lanceolate leaflets. Flowers 1—3 together on elongated axillary peduncles. Calyx glabrous, 4 mm long, the teeth lanceolate-acuminate. Corolla yellow, more than twice the calyx. Pod linear, 2—5½ cm long, 10—12 mm

broad, channelled down the upper suture but not winged, 6—9-seeded.
— Flow. March to April.

N. d. Damietta; Essâwy; Kafr Dowar.

Also known from Europe and the Mediterranean North Africa.

786. (4.) **Lathyrus hierosolymitanus** Boiss. Diagnos. Plant. Orient., Ser. I fasc. IX (1849) p. 127. — Flor. Or. II, p. 604. — Aschers.-Schweinf. Ill. Flor. d'Eg. Supplem., p. 756. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 647 no. 119. — An annual plant, 30—60 cm high, stems ascending or climbing, winged, especially toward the top. Stipules semi-sagittate, narrowly linear-lanceolate, shorter than the petiole. Leaflets linear-lanceolate, often 1 cm long, and 1,4 cm broad. Peduncles 2—3-flowered, shorter than the leaf; corolla yellowish-pink, 1,2 cm long; pod linear, netted-veined, with straight upper border, and six, coarse-tubercled seeds.

M. ma. Mariut-Mergheb in fields (Blomfield).

Also known from Western Marmarica, Palestine and Syria.

787. (5.) **Lathyrus sphaericus** Retz. Observ. Bot. III (1789 to 1791), p. 39. — Boiss. Flor. Or. II, p. 613. — *Lathyrus angulatus* Sibth. and Smith Flor. Graec., tab. 696 not Linn. — DC. Prodrum. II, p. 372. — A glabrous suberect annual with slender wingless stems. Leaves with a single pair of linear leaflets, the tendril a mere bristle in the lower ones. Flowers solitary on short axillary peduncles. Calyx under 6 mm long, the teeth lanceolate. Corolla purple, the standard twice the calyx. Pod linear, 2½—5 cm long, 4—6 mm thick, glabrous, not winged. — Flow. March to April.

N. d. S. W. of Sâlihîya, on alluvial ground.

Also known from Southern Europe.

788. (6.) **Lathyrus Cicer** L. Spec. Plant. I (1753), p. 1030. — Boiss. Flor. Or. II, p. 605. — Rehbeh. Ic. XXII, tab. 203 fig. 1—4. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 69 no. 398. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 647 no. 120. — Sickenberg. Contrib. Flor. d'Eg., p. 222. — An annual plant, 20—50 cm high, sometimes more; stems ascending or climbing, narrowly winged. Stipules semi-sagittate, oblong-lanceolate, usually a little longer than the petiole; leaflets linear-lanceolate to linear. Peduncles 1-flowered, shorter than the leaves; corolla red, 1,5 cm long; pod oblong, 2,5 cm long, 6 mm to 1 cm broad, upper border nearly 2-winged; seeds 4—5, glabrous. — Flow. March to April.

M. ma. Marmarica: Matruqa; Dakalla; Abusîr; Mariut; Alexandria-East and -West; Mandara; Abukîr. — **N. v.** Esne.

Also known from all the other parts of the Mediterranean region.

789. (7.) **Lathyrus marmoratus** Boiss. and Blanche in Flor. Orient. II (1872), p. 606. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 647 no. 121. — Sickenberg. Contrib. Flor. d'Eg., p. 222. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 69 no. 401. — An annual herb, 30—60 cm high or more, stems slender, diffuse, narrow-winged. Stipules semi-sagittate, oblong to lanceolate, as long as the petiole; leaflets lanceolate-linear, mucronate. Peduncles 1-flowered, shorter than the leaf; calyx-lobes twice as long as the tube; corolla pale violet-pink; pod linear sub-rhombic, 2 cm long, 6 mm broad, upper margin with two narrow wings; seeds 3—4, globular, rusty- and black-marbled. — Flow. March to April.

M. ma. Marmarica: Matruqa; Alexandria-West and -East. — **M. p.** El-'Arish; Wady; El-Grâdy. — **N. d.** Cairo.

Also known from Marmarica, Palestine and Syria.

790. (8.) **Lathyrus sativus** L. Spec. Plant. I (1753), p. 1030. — Boiss. Flor. Or. II, p. 606. — Ic. Flor. Graec., tab. 695. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 69 no. 402. — Sickenberg. Contrib. Flor. d'Eg., p. 222. — DC. Prodom. II, p. 373. — A slender diffuse glabrous annual with stems narrowly winged upwards. Leaves with a single pair of lanceolate leaflets, 25—40 mm long, 4—6 mm broad. Flowers solitary on axillary peduncles. Calyx 5 cm deep, the teeth lanceolate. Flowers reddish-purple or white, the standard 15—20 mm broad. Pod oblong, 25—36 mm long, 10—20 mm lines broad, glabrous, 3—4-seeded, narrowly winged down each side of the upper suture. — Flow. March to April.

M. ma. N. d. N. f. N. v. O. Cultivated and naturalized everywhere abundantly.

Local name: gilbân.

Also known from Europe.

791. (9.) **Lathyrus hirsutus** L. Spec. Plant. I (1753), p. 1032. — Boiss. Flor. Or. II, p. 609. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 69 no. 403. — Sickenberg. Contrib. Flor. d'Eg., p. 222. — An biennial herb, 20—50 cm high, hirsute or glabrous. Stems angled, branching, leafy from the base. Leaflets 1 pair, elliptical, 2 cm long, 1—1.4 cm broad, acute or acuminate; stipules nearly as large as the leaflets, resembling them in shape, but with lanceolate appendix at the base. Peduncles 2—5-flowered, longer than the leaves; raceme one-sided; calyx-teeth lanceolate, acuminate, twice as long as the tube; corolla violet; pod 4 cm long, 4 mm broad, black, somewhat curved upward. — Flow. March to April.

M. ma. N. d. N. f. N. v. O. Often on alluvial ground.

Local name: sa'eydeh (Ehrenberg); gilbân.

Also known from Europe.

305. (39.) **Pisum** Linn.

Same as *Lathyrus* in habit, and other particulars, except the style which is inflexed, flattened from above downward, the margins bent downward, and united at tip in a laterally flattened stigma, bearded along its upper surface. — Annual or perennial herbs with abruptly pinnate leaves, and cirrhose or aristate petioles.

A small genus of only a few species in Europe and the Mediterranean region.

792. **Pisum sativum** L. Spec. Plant. I (1753), p. 1026. — Boiss. Flor. Or. II, p. 622. — Cus. and Ansb. Herb. Flor. Fr., tab. 1259 and 1260. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 69 no. 404. — Sickenberg. Contrib. Flor. d'Eg., p. 222. — *Pisum arvense* L. Spec. Plant. I, p. 1026. — An annual plant, 1—2 cm high. Stipules as long as 1—2-flowered peduncles; leaflets entire, 3—4 cm long, 2—3 cm broad. Flowers white a pink. Seeds globular, smooth, 6—8 mm in diameter. — Flow. March.

N. f. Naturalized. — **N. d.** **N. v.** Cultivated everywhere abundantly.

Local name: basilla; besille.

Cultivated everywhere in Europe, the Mediterranean region etc.

var. **elatus** (M. B.) Alef. in Landwirtsch. Flora (1862), p. 63. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 69 no. 404. — Sickenberg. Contrib. Flor. d'Eg., p. 222. — *Pisum elatius* M. Bieb. Flor. Taur.-Caucas. II, p. 151. — Boiss. Flor. Or. II, p. 623. — *Pisum arvense* Sibth. and Smith Flor. graec., tab. 687 not L. — An annual herb, 1—3 cm high, climbing. Stipules often twice as large as leaflets, often 7 cm long, 4 cm broad, shorter than the 1—3-flowered peduncles; leaflets entire or dentate, 2—3 cm long, 1—2 cm broad. Flowers violet-purple, with deep purple wings; seeds granular, grey, mottled with brown. — Flow. March to April.

N. d. Tell-el-Kebîr, naturalized (Schweinfurth). — **N. v. mer.** Abundantly cultivated everywhere.

Also known from the other parts of the Mediterranean region, Caucasia, Persia and Himalaya.

306. (40.) **Vigna** Savi.

Calyx with the two upper teeth free or connate, the others equal or the lowest longer. Standard orbicular, the base appendiculate, with inflexed auricles; wings falcate-obovate, rather shorter than the standard; keel equalling the wings, truncate, or beaked at the tip, but the point not spiral. Upper stamen free, the others

connate; anthers uniform. Ovary sessile, multiovulate; style filiform, dilated upwards, longitudinally bearded on the inner side upwards; stigma very oblique. Pod linear, straight or recurved, subterete, two-valved, filled within between the seeds. — Climbing herbs with pinnately trifoliolate leaves.

A genus widely dispersed through the warmer regions of both hemispheres.

A. Pod 4—6 cm long 1. **V. nilotica**.

B. Pod 12—25 cm long 2. **V. sinensis**.

793. (1.) **Vigna nilotica** (Del.) Hook. Fil. Niger Flor. (1849), p. 311. — Boiss. Fl. Or. II, p. 625. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 69 no. 406. — *Dolichos niloticus* Del. Illustr. Flor. d'Eg., p. 323 tab. 38 fig. 1. — *Dolichos luteolus* Jacq. Hort. Vind., tab. 90. — DC. Prodrum. II, p. 399. — *Dolichos sinensis* Forsk. Flor. aeg.-arab., p. 117 not Linn. — Stems twining, subglabrous. Stipules lanceolate, 6—8 mm long. Petioles 2—5 cm long, glabrous; leaflets 3, central one ovate-rhomboidal or slightly hastate, 4—8 cm long, pointed, the base broad-cuneate; petiolule 4—6 mm long; lateral ones unequal-sided, both sides glabrous. Flowers 4—8 in close racemes on peduncles 6—12 cm long. Bracteoles small blunt. Pedicel very short, glabrous. Calyx campanulate, glabrous, 4 mm deep; teeth deltoid, reaching a third down, the two upper ones connate. Corolla yellowish-green, 5—8 mm deep. Pods 4—6 cm long, 4 mm broad, pendulous, sub-compressed, slightly curved, glabrous, slightly torulose, 6—8-seeded. — Flow. March to April.

N. d. N. f. N. v. A often cultivated plant.

Local name: 'ulleyq.

Also known from Tropical Africa.

794. (2.) **Vigna sinensis** Endl. ex Hassk. Plant. Jav. rar. (1848), p. 386. — var. **sesquipedalis** Koernicke in Correspondenzbl. naturhist. Ver. Rheinl. Westf. (1885), p. 147. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 69 no. 406 a. — Sickenberg. Contrib. Flor. d'Eg., p. 223. — *Dolichos Lubia* Forsk. Flor. aeg.-arab., p. LXX no. 363 and p. 133. — *Dolichos sinensis* L. Amoen. IV, p. 326. — *Dolichos Catiang* L. Mant., p. 269. — DC. Prodrum. II, p. 399. — *Dolichos sesquipedalis* L. Spec. Plant. I, p. 1026. — *Dolichos melanophthalmus* DC. Prodrum. II, p. 399. — Stems annual, twining, subglabrous. Stipules ovate-lanceolate, subpeltate, 8—12 mm deep. Petioles 4—12 cm long, glabrous; leaflets 3, central one roundish or ovate, 6—12 cm long, acute, the base rounded; petiolule 2—5 cm long, lateral ones often unequal-sided, both sides glabrous. Flowers in 6—12-flowered racemes on

glabrous peduncles 12—25 cm long. Bracts like the stipules. Pedicels very short. Calyx glabrous, 4 mm deep; teeth deltoid acuminate, shorter than the tube, the two upper ones connate. Corolla yellow or reddish, 2.5 cm deep. Pods pendulous, glabrous, 16—25 cm long, 8 mm broad, subcompressed, 10—15-seeded. slightly torulose when fully matured, with a thick decurved beak. Seeds white, red or black. — Flow. December to March.

M. ma. M. p. N. d. N. f. N. v. D. a. sept. D. a. mer. O. Cultivated everywhere and often subsponaneous.

Local name: lubiâ beledy (Forsk.); generally: lubiâ; mâse (Delile).

Also known from Tripolitania, Nubia, Abyssinia, Senegambia, Guiana. tropical Asia and Southern Europe.

307. (41.) **Dolichos** Linn.

Calyx campanulate, with short teeth, the 2 upper teeth united. Standard orbicular, auricled at the base, bicallose in front. Wings adherent to the keel, which is much incurved and often beaked, but not twisted. Upper stamen free; anthers uniform. Ovary many-ovuled. Style thickened above, with a longitudinal line or a tuft of hairs below the terminal stigma. Pod falciform or straight, compressed, filled between the seeds. 2-valved, the sutures often thickened. Seeds compressed, with a short raphe. — Prostrate or twining herbs or undershrubs. Leaves pinnately trifoliolate, with small stipels. Flowers either single or fascicled in the axils of leaves, or along the nodes of an axillary peduncle, purple, yellowish or white. Bracteoles striate, usually small and caducous.

A genus of the tropics of Africa, Asia and Australia, with a few species in S. America.

795. **Dolichos Lablab** L. Spec. Plant. I (1753), p. 1019. — Boiss. Flor. Or. II, p. 626. — Bog. Mag., tab. 896. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 69 no. 406a. — Sickenberg. Contrib. Flor. d'Eg., p. 222. — Lablab vulgaris Sav. ap. DC. Prodr. II, p. 401. — Lablab uncinatus A. Braun in Schimp. Hb. Abyss. — Dolichos crenatifructus Steud. in Schimp. Hb. Abyss., no. 513. — A wide-climbing perennial, with subglabrous stems. Leaflets 3, membranous, acute, glabrous above, nearly or quite so below; central one ovate-deltoid, 6—9 cm long, broadly spathulately narrowed at the base. Flowers in fascicled lax racemes 6—9 cm long, on firm elongated peduncles. Calyx broadly campanulate, 2½—6 mm long, subglabrous, with a pair of roundish deciduous bracteoles at the base, two upper teeth connate, the others shorter than the tube. Corolla reddish or pale, 9—18 mm deep, the keel abruptly incurved. Pod 2½—5 cm

long, 15—25 mm broad, narrowed at the base, the upper suture nearly straight, the faces glabrescent, rarely persistently pubescent; seeds 2—4; style flattened upwards, not twisted, narrowed at the base. — Flow. January to March.

M. ma. M. p. N. d. N. f. N. v. O. D. l. D. i. D. a. sept. D. a. mer.
Cultivated everywhere abundantly and naturalized.

Local name: liblâb; lubiâ; lubiâ âfin (forma-sativa Schweinf. in litt.); ugudky; kasheriny; sherangêb (Schweinfurth).

Cultivated everywhere in the Tropics.

var. **hortensis** Schweinfurth and Muschler nov. var. — Flowers violet-purple. — Flow. March.

M. ma. M. p. N. d. N. f. N. v. O. D. l. D. i. D. a. sept. D. a. mer.
Cultivated everywhere.

Also known from Palestine.

308. (42.) **Rhynchosia** Lour.

Upper teeth of the calyx more or less connate, the lowest one longer than the others. Standard obovate or orbicular, patent or reflexed, the base appendiculate with inflexed auricles; wings narrow; keel incurved at the apex. Upper stamen free, the others connate; anthers uniform. Ovary subsessile, biovulate in our species; style incurved upwards, filiform or incrassated; stigma small, terminal. Pod subcompressed, falcate-oblong, two-valved, continuous or rarely septate internally. Seeds two or by abortion one. — Twining shrubs or undershrubs.

A large genus, dispersed throughout the tropics, also Cape, and a few species in temperate Nord America.

796. **Rhynchosia Memnonia** (Del.) DC. Prodrum. II (1825). p. 386. — Boiss. Flor. Or. II, p. 625. — Oliv. Flor. Trop. Afr. I, p. 220. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 69 no. 405. — Sickenberg. Contrib. Flor. d'Eg., p. 223. — Glycine Memnonia Del. Illustr. Flor. d'Eg., p. 100 tab. 38 fig. 3. — Glycine Schimperii Hochst. and Steudn. in Schimp. Hb. Arab. — Stems firm-herbaceous, suberect or twining, densely grey-silky. Stipules minute, setaceous. Petioles 2.5 cm or less long, firm; leaflets 3, central one nearly round, 1—2 cm each way, blunt, the lower half often subcuneate; petiolule 4 mm long, lateral ones unequal-sided; texture subcoriaceous, both sides, especially the lower one, densely grey-silky. Flowers in lax 6—20-flowered racemes 4—8—10 cm long on short firm peduncles. Bracts and bracteoles minute, setaceous, deciduous. Pedicels a line long, silky, cernuous. Calyx 2—5 1/2 mm deep, grey-silky, the teeth

lanceolate, reaching about half down. Corolla yellow, 10 mm deep, the standard silky on the outside. Pod 1,2—1,5 cm long, 4 mm broad, finely grey-pubescent, narrowed at the base, bluntish. — Flow. March.

N. f. Medînet-el-Fayûm; Begîg; Fidmîn; Senhûr; Tamîa; El-Wady; El-Hammâm; Kafr Mukfût. — **N. v.** Everywhere, abundant on the bords of the Nile; Islands of the Sirdar near Aswân. — **O.** Little Oasis; Dakhel; Great Oasis. — **D. l.** Kafr Hakîm; Abu Roash; Pyramids of Gîza. — **D. a. mer.** Qoseyr.

Local name: khobbeyly (Schweinfurth).

Also known from Tropical Africa.

Geraniales.

Herbs, shrubs or trees. Leaves alternate or opposite: blades simple or compound. Flowers perfect, monoecious or dioecious, variously disposed, mostly regular. Calyx of distinct sepals. Corolla of distinct or nearly distinct petals, rarely wanting. Androecium of as many stamens as there are sepals, or twice as many, or rarely more. Filaments distinct or united. Anthers opening lengthwise, distinct. Gynoecium of 2 or several united carpels, superior. Ovules pendulous, 1—2 in each cavity, the raphe turned toward the axis of the gynoecium. Seeds various.

47. Geraniaceae.

Flowers usually hermaphrodite, regular or irregular. Sepals 5, or rarely fewer, free, or rarely connate at the base, imbricate or valvate in the bud. Petals as many or rarely wanting, hypogynous or slightly perigynous, variously imbricate in the bud. Torus more or less expanded into a disk, often bearing 5 glands alternate with the petals, and usually protruding into a short axis in the centre of the ovary. Stamens usually twice the number of the petals. 5 of them occasionally without anthers, or rudimentary, or in irregular flowers, 3 or more without anthers or wanting; filaments either free and filiform, or dilated or connate at the base; anthers with 2 parallel cells. Ovary usually 3—5-lobed, with as many cells, the carpels adnate to the axis up to the insertion of the ovules, and often produced above that into a beak bearing the style or stigmas; stigmas as many as cells, either raised on the style or sessile on the carpels, radiating from a connate base or rarely entirely connate. Ovules either 1 in each cell or 2 inserted nearly at the same point, 1 ascending, the other pendulous, or several in 1 or 2 rows. Fruit

either a lobed capsule, the lobes 1-seeded, separating from the axis with the seed, and elastically rolled upwards along the beak, leaving the placentiferous portion attached to the axis, or the lobes several-seeded, remaining attached to the axis, but opening loculicidally, or the fruit is a berry or separates into indehiscent cocci. Seeds pendulous or ascending; testa thin or rarely crustaceous; albumen usually scanty or none. Embryo straight or curved, radicle short and straight or long and curved or forked over the cotyledons. — Herbs or shrubs, or rarely trees. Leaves opposite or alternate, toothed, lobed, or divided, very rarely quite entire. Stipules usually 2. Peduncles axillary, 1 or 2-flowered, or bearing an umbel of several flowers, very rarely a cyme or raceme.

A considerable Order with representatives in every quarter of the globe. Two of the largest genera are very numerous at the Cape and characteristic of its Flora.

- A. Tribe *Geranieae*. — Flowers regular or nearly so, usually with hypogynous glands. Sepals not spurred. Leaves simple.
- | | |
|--------------------------|---------------------|
| I. Stamens 15 | 1. Monsonia. |
| II. Stamens 10 | 2. Geranium. |
| III. Stamens 5 | 3. Erodium. |
- B. Tribe *Pelargoniceae*. — Flowers irregular. Posterior sepal with a spur adnate to the pedicel 4. **Pelargonium.**

309. (1.) **Monsonia** Linn.

Flowers regular. Sepals 5, imbricate. Petals 5. Stamens 15, all antheriferous, in 5 connate phalanges of 3 each. Ovary 5-lobed, 5-celled; stigmatic lobes as many; ovules geminate, obliquely superposed. Cocci separating from the axis with revolute elastic tails pilose at the base within. — Herbs or frutescent; sometimes succulent. Leaves opposite or alternate, toothed or cut, petiolate, stipulate; petioles sometimes spinescent. Peduncles apparently axillary, 1 to 2-(or several)-flowered.

A small genus, principally confined to the Cape.

- A. Bracts ovate 1. **M. nivea.**
 B. Bracts oblong-lanceolate 2. **M. heliotropoides.**

797. (1.) **Monsonia nivea** I. Gay Adnot. in Herb. (1836). — Desne. in Webb Fragm., p. 59. — Boiss. Flor. Or. II, p. 897. — Coss. Illustr. Flor. Atlant. II, p. 23 tab. 110. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 55 no. 239. — Sickenberg. Contrib. Flor. d'Eg., p. 200. — Aschers. Flor. Rhinocol., p. 793 no. 62. — *Erodium niveum* Decsne Flor. Sinaic. in Ann. Scienc. Nat., ser. 2 Vol. III p. 285. —

An biennial or perennial herb, 15 to 25 cm high or sometimes somewhat more, stems procumbent, whitehispid. Leaves ovate-oblong, appressed-silvery-canescant, crenatetoothed, plicate above. Sepals obovate-oblong, canescant, scarcely mucronate; petals flesh-colored, obovate, scarcely longer than the calyx; beak 4 cm long, 6—8 times as long as the capsule. — Flow. November to March.

M. p. El-‘Arish (Kotschy). — **D. l.** Es-Sabrigât; Kafr Dâwûd; Kafr Hakîm; Abu-Roash; Pyramids of Gîza and Saqqâra; Beni-Selâma, between Great Oasis and Esna; Edfu; Wady Sellema. — **D. i.** Sâlihîya, not common in deep sandy places; Ismailia; Ramses, on sandy hills, common. — **D. a. sept.** Not rare in the Wadies of Arabian desert on calcareous ground under bushes of *Pennisetum dichotomum* (form with short roots).

Local name: yahaq (Muschler).

Also known from Tripolitania, Arabia Petraea and Palestine.

798. (2.) **Monsonia heliotropoides** (Cav.) Boiss. Flor. Or. I (1867), p. 897. — Aschers.-Schweinf. Ill. Flor. d’Eg., p. 55 no. 240. — DC. Prodr. I, p. 638. — *Geranium heliotropoides* Cavan. Diss. IV, p. 220 tab. 113 fig. 2. — *Monsonia hispida* Boiss. Diagnos. Plant. Orient., Ser. I fasc. VIII p. 120. — Rhizome woody; stems and pedicels sparingly hispid. Leaves long-petiolate, appressed canescant, ovate, acute, crispulous-denticulate at the margin; peduncles long, many-flowered; bracts oblong-lanceolate, acuminate; sepals appressed canescant, obovate, mucronate; stamens adelphous shortly connate at the base; filaments ciliate; valves hirtulous. — Flow. March to April.

D. a. sept. Northern and Southern Galala; rare in the Arabian desert on calcareous ground. — **D. a. mer.** Qoseyr.

Also known from Persia.

310. (2.) *Geranium* Linn.

Herbs, with forked stems often swollen at the nodes, opposite, palmately divided leaves, and purplish flowers, solitary or 2 together, on axillary peduncles. Stamens 10, of which 5 shorter, but generally with anthers. Ovary 5-lobed, terminating in a long beak with 5 short stigmas on the top, the lobes being all whorled round the long-beaked receptacle. Capsule separating into 5 1-seeded carpels, which curl upwards, with a long elastic awn, detached from the beak, and glabrous inside.

A genus spread over the northern hemisphere, with a few species in the southern, but always without the Tropics. It is easily distinguished from all but *Erodium* by the long beak of the fruit, which has given to the two genera *Geranium* and *Erodium* the popular name of Crane’sbill.

A. Beak of the ripe fruit usually 1 cm long . . . 1. *G. molle*.

B. Beak of the ripe fruit 2 cm long 2. *G. dissectum*.

799. (1.) **Geranium molle** L. Spec. Plant. I (1753), p. 955. — Boiss. Flor. Or. I, p. 882. — Rehb. Ic. V, fig. 4879. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 54 no. 226. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 599 no. 58. — Sickenberg. Contrib. Flor. d'Eg., p. 199. — *Geranium leiocaulon* Ledeb. Flor. Ross. I, p. 470. — An annual, often tufted at the base, more or less covered with rather long, soft, spreading hairs; the stems weak and spreading, very short when first flowering, and seldom attaining 30 cm. Radical leaves numerous, on very long stalks, orbicular, rather above 2,5 cm diameter, divided to below the middle into 7—11 obovate or wedge-shaped lobes, which are again 3 or 5-lobed; the upper leaves few, small, with fewer but deeper and narrower divisions. Peduncles shorter than the leaves, each with 2 small purplish flowers; the sepals obtuse or scarcely pointed; the petals deeply notched, scarcely longer than the calyx. Carpels usually distinctly marked with transverse wrinkles. Seeds quite smooth without dots. — Flow. February to March.

M. ma. Marmarica: Matruqa; Mariut; Alexandria-West and -East; in sandy places, not common.

Local name: qarna (Muschler).

Also known from all the other parts of the Mediterranean region, Europe, Caucasia, Persia and India.

800. (2.) **Geranium dissectum** L. Spec. Plant. I (1753), p. 956. — Boiss. Flor. Or. I, p. 881. — Rehb. Ic. V, fig. 4876. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 54 no. 225. — Sickenberg. Contrib. Flor. d'Eg., p. 119. — An annual, like the last one, but often more erect, and usually more branched, and the leaves much more deeply divided into 5, 7, or 9 narrow segments, which are again deeply trifid or lobed. Peduncles very short, bearing two small purple flowers; the sepals large with distinct subulate points; the petals about their length, slightly notched. Carpels hairy, without wrinkles. Seeds beautifully and minutely reticulated or dotted. The hairiness of the plant is variable; usually the stems are clothed with long, reflexed, hairs, the leaves with a short, soft down. — Flow. January to March.

M. ma. Abusir; Alexandria-West and -East; Mandara; Abukir, common on way-sides. — **N. d.** Damanhur; Mansura; Tanta; Zaqaziq; Qalyub; Cairo and its environs, on way-sides. — **O.** Siwa; Little Oasis; Dakhel.

Also known from the other parts of the Mediterranean region, Middle Europe, Caucasia and Mesopotamia.

311. (3.) *Erodium* Linn.

Prostrate or decumbent herbs, differing from *Geranium* in the divisions or nerves of the leaves being pinnate, not palmate; in the stamens always reduced to 5, the 5 alternate ones being rudimentary only; in the awns of the carpels bearded with a few long hairs on the inside, and spirally twisted after they are detached from the axis. The flowers are also frequently more than 2 together, in an umbel on the summit of the peduncle.

The geographical range is nearly that of *Geranium*, in which genus it was included by Linnaeus. But the greater number of the species are maritime plants from the Mediterranean regions, or roadside weeds, with flowers so insignificant that but few have ever been cultivated.

A. Beak persistent, bristly within. Valves with 2 pores at the tip.

I. Leaves all pinnately or 2-pinnately cut.

- | | |
|---|---------------------------|
| a) Beak 4—5 times as long as the carpels | 1. <i>E. cicutarium</i> . |
| b) Beak 6—7 times as long as the carpels | 2. <i>E. moschatum</i> . |
| c) Beak 8—10 times as long as the carpels | 3. <i>E. ciconium</i> . |

II. Leaves (or at least the lower ones) undivided or lobed.

a) Petals as long as the sepals.

- | | |
|---|----------------------------|
| 1. Beak 4—5 times as long as the carpels. | |
| α) Filaments ciliate | 4. <i>E. chium</i> . |
| β) Filaments glabrous | 5. <i>E. aegytiacum</i> . |
| 2. Beak 6—8 times as long as the carpels | 6. <i>E. triangulare</i> . |

b) Petals longer than the sepals.

- | | |
|--|---------------------------|
| 1. Beak 6—8 times as long as the carpels | 7. <i>E. gruinum</i> . |
| 2. Beak 3—4 times as long as the carpels | 8. <i>E. malacoides</i> . |

B. Beak deciduous, plumose. Pore at the tip of the valves O.

I. Perennials.

- | | |
|--|-------------------------------|
| a) Beak 16 times as long as the carpels | 9. <i>E. hirtum</i> . |
| b) Beak 10—14 times as long as the carpels | 10. <i>E. glaucophyllum</i> . |
| c) Beak 8—9 times as long as the carpels | 11. <i>E. arborescens</i> . |

II. Biennials 12. *E. bryoniaefolium*.

801. (1.) *Erodium cicutarium* (L.) L'Hér. Géraniolog. (1787), p. 5 no. 12. — Boiss. Flor. Or. I, p. 890. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 54 no. 227. — Knuth in Engler Pflanzenreich IV, fasc. 129 (1912), p. 274. — *Erodium stellatum* Delile Ind. Sem. Hort. Monspel. (1838), p. 6. — *Erodium melanostigma* var. *thalictroides* Delile in Linnaea XIII, p. 104. — *Erodium filicinum* Pomel Nouv. Mat. Flor. Atl., p. 339. — Usually an annual, but often forming a dense tuft,

with a thick taproot, and in some situations lasting at least a second year, always more or less covered with spreading hairs, which are sometimes viscid. Stems sometimes exceedingly short, sometimes lengthening out to 6 cm or near 30 cm. Leaves mostly radical, pinnate, on long stalks, the segments distinct and deeply pinnatifid, with narrow, more or less cut lobes. Peduncles erect, bearing an umbel of from 2 or 3—10 or 12 small purple or pink flowers. Sepals pointed, about the length of the obovate, entire petals. Carpels slightly hairy, the beak varying from 26—28 mm in length. — Flow. March to April.

M. ma. Mariut; Alexandria-West and -East. — **D. a. sept.** Gebel ahmar near Cairo; Northern and Southern Galala. — **O.** Little Oasis; Dakhel; Great Oasis.

Local name: qarna (Wilkinson).

Also known from all the other part of the Mediterranean region, Europe and Persia.

802. (2.) **Erodium moschatum** L'Hérit. Geran. (1787), p. 6 no. 13. — Boiss. Flor. Or. I, p. 891. — Rchb. Ic. V, fig. 4867. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 54 no. 228. — Sickenberg. Contrib. Flor. d'Eg., p. 199. — Knuth in Engler Pflanzenreich IV (1912), fasc. 129 p. 282. — *Geranium moschatum* L. Spec. Plant. I, p. 680. — *Geranium arenarium* Burm. Spec. Geran., p. 48. — An annual erect herb, 20—40 cm high or more, sparingly glandular-viscid above; stems ascending, rather fleshy. Leaves pinnatisect into 10—13, large, ovate, doubly serrate leaflets. Sepals ending in a stout mucro; petals pink, unequal, obovate, as long as the calyx; beak 4 cm long, 6—8 times as long as carpels. — Flow. March to April.

M. ma. Alexandria.

Also known from all the other parts of the Mediterranean region, Middle Europe and Persia.

803. (3.) **Erodium ciconium** L'Hérit. Geraniol. (1787), p. 7 no. 16. — Boiss. Flor. Or. I, p. 891. — Rchbch. Ic. V, fig. 4866. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 54 no. 229. — Sickenberg. Contrib. Flor. d'Eg., p. 199. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 599 no. 59. — *Erodium ciconium* var. *aristatum* Post Flor. of Syria, Sinai and Palestine, p. 194. — *Geranium ciconium* L. Spec. Plant. I, p. 21. — An annual erect herb, 10—40 cm high, sometimes more pubescent-viscid. Leaves ovate, pinnatipartite in to ovate, pinnatifid or parted obtusely dentate segments; rachis dentate, winged. Sepals glandular, long-mucronate; petals purple,

obovate, as long as the calyx, the upper retuse; beak 10—12 cm long, 8—10 times as long as the carpel. — Flow. March to April.

M. ma. Marmarica: Matruqa; Mariut; Abusir; Montaza; Alexandria-West and -East; Mandara; Abukir.

Local name: abû mushfah (Ascherson).

Also known from all the other parts of the Mediterranean region.

804. (4.) **Erodium chium** (L.) Willd. Spec. Plant. III (1800), p. 634. — Boiss. Flor. Or. I, p. 894. — Aschers.-Schweinf. Illustr. Flor. d'Eg., p. 55 no. 233. — Sickenberg. Contrib. Fl. d'Eg., p. 200. — Geranium Chium L. Spec. Plant. I, p. 951. — Cavan. Diss. IV, tab. 92 fig. 1. — Geranium murcicum Cavan. Diss. IV, tab. 126 fig. 1. — In the lower part papillose, eglandulose; stems diffused. Leaves glabrous, orbiculate, the lower ones cordate, lobate; the upper ones trifid or tripartite; stipules ovate acute; peduncles many-flowered; sepals long-mucronate; petals rose-coloured as long as the calyx; filaments ciliate; beak 5—6 times as long as the carpels. — Flow. February to March.

M. ma. Mariut; Alexandria-West and -East.

Local name: Abu mushfah (Ascherson).

Also known from Southern Europe and the other parts of North Africa.

805. (5.) **Erodium aegyptiacum** Boiss. Diagnos. Plant. Orient. Ser. II fasc. I (1853) p. 111. — Flor. Or. I, p. 894. — Aschers.-Schweinf. Illustr. Flor. d'Eg., p. 55 no. 234. — Sickenberg. Contrib. Flor. d'Eg., p. 200. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 600 no. 63. — Erodium neuradaefolium Del. in Godr. Flor. Juven., p. 17. — Sparingly hairy, the stems and leaves appressed greyish-pubescent; stems diffuse. Leaves ovate-oblong trilobate or tripartite, lobes acute, incise-dentate; stipules ovate, acute; peduncles many-flowered; sepals hirsute mucronate; petals rose coloured as long as the calyx; filaments glabrous; beak 5—6 times as long as the carpel. — Flow. March to April.

N. d. N. v. Abundant on gravelly soil. — **D. i.** Sâlibiya; Ismailia; Ramses-Station.

Local name: timmeyr (Muschler).

Also known from Palestine.

806. (6.) **Eriodidum triangulare** (Forsk.) Muschler comb. nov. — Erodium laciniatum Willd. Spec. Plant. III (1800), p. 633. — DC. Prodr. I, p. 646. — Boiss. Flor. Or. I, p. 893. — Knuth in Engler Pflanzenreich IV (1912), fasc. 129 p. 241. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 54 no. 231. — Sickenberg. Contrib. Flor. d'Eg., p. 199. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 599

no. 61. — Ascherson Flor. Rhinocol., p. 792 no. 60. — Aschers. Flor. Sirbon., p. 811 no. 6. — *Erodium alexandrinum* Del. Illustr. Flor. d'Eg., p. 25 no. 629. — *Erodium reflexum* Del. Illustr. Flor. d'Eg., p. 20 no. 623. — *Geranium triangulare* Forsk. Flor. aeg.-arab., p. 123. — *Geranium laciniatum* Cav. Diss. IV (1787), p. 228 tab. 113 fig. 3. — Viv. Flor. Liby. I, p. 38. — An biennial plant, 30—50 cm high, procumbent; stems and petioles retrorse-hairy, rarely glabrescent, the lowest cordate-ovate, obtusely 3-lobed, the others 1—2-pinnatisect or parted into short, acutish lobules. Sepals glandular-hairy, mucronate; petals purple, oblong, as long as the calyx, or longer; beak 6 cm long, slender, 6—8 times as long as the appressed-hairy carpels. — Flow. February to March.

M. ma. Marmarica: Matruqa; Alexandria-West and -East; Abukîr. — **M. p.** El-Gels Mohamedîya; Qatîya to el-'Arish. — **D. l.** **D. i.** **D. a. sept.** **D. a. mer.** Common on calcareous ground.

Local name: abû mushfah (Ascherson); 'aqul; bakh tery; abû uqqeyl (Ascherson); qarnâ; morphât (Klunz.).

Also known from all the other parts of the Mediterranean region.

807. (7.) **Erodium gruinum** L'Herit. Géraniol. (1787), p. 6 no. 15. — DC. Prodom. I, p. 647. — Boiss. Flor. Or. I, p. 892. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 54 no. 230. — Sickenberg. Contrib. Flor. d'Eg., p. 199. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 599 no. 60. — Knuth in Engler Pflanzenreich IV (1912), p. 259, fig. 34. — *Erodium monsonioides* Steud. ex Boiss. Flor. Or. I, p. 892. — *Geranium gruinum* L. Spec. Plant. I, p. 680. — *Geranium uniflorum* Pacho Voy. dans la Marmar. et la Cyrén., tab. 96. — *Erodium tordilioides* Viv. Flor. Libyc., p. 39. — An annual erect herb, 20 to 50 cm high or sometimes somewhat more; stem thick, sparingly hirsute. Leaves appressed-papillary, the lowest undivided, cordate-ovate, the others triangular, divided into three, sessile, acutely dentate leaflets, the terminal longer, elongated, 3—5-lobed. Sepals 1 cm long, mucronate to aristate; petals violet, obovate, longer than the sepals; beak 7 cm long, stout, 6—8 times as long as the carpels. — Flow. February to March.

M. ma. Marmarica: Matruqa; Montaza; Mariut; Alexandria-West and -East; Mandara in sandy places. — **N. d.** Not rare in sandy places, on the margin of the fields. — **N. f.** Fidemin, in plantations of *Opuntia*.

Local name: abû mushfah (Ascherson).

Also known from Tripolitania, Southern Europe, Syria, Asia Minor and Persia.

808. (8.) **Erodium malacoides** (L.) Willd. Phyt. I (1794), p. 10. — DC. Prodrum. I, p. 648. — Boiss. Flor. Or. I, p. 893. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 55 no. 232. — Sickenberg. Contrib. Flor. d'Eg., p. 200. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 600 no. 62. — Aschers. Flor. Rhinocol., p. 793 no. 61. — *Erodium glabellum* Del. Illustr. Flor. d'Eg., p. 20. — *Erodium floribundum* Batt. in Bull. Soc. Bot. France XXX (1883), p. 265. — *Geranium malacoides* L. Spec. Plant. I, p. 680. — Forsk. Flor. aeg.-arab., p. 123. — An annual plant 30—50 cm high or more, erect or diffuse, clothed with short, spreading hairs; inflorescence glandular. Leaves appressed-pubescent, ovate-oblong, obscurely lobed, the lower cordate. Sepals glandular-hairy, mucronate; petals lilac, obovate, somewhat longer than the calyx; beak 3—4 cm long, slender, 3—4 times as long as the carpels. — Flow. March to April.

M. ma. Marmarica: Matruqa; Alexandria-East. — **M. p.** El-Wady; el-Grady. — **N. d. N. f.** Not common on way sides. — **O.** Little Oasis; Dakhel; Great Oasis. — **D. i.** Wady-el-Arish.

Local name: 'uqeyl (Ascherson).

Also known from all the other parts of the Mediterranean region.

809. (9.) **Erodium hirtum** (Forsk.) Willd. Spec. Plant. III (1800), p. 632. — DC. Prodrum. I, p. 646. — Boiss. Flor. Or. I, p. 894. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 55 no. 235. — Brumh. *Erodium* Mon., p. 39. — Sickenberg. Contrib. Flor. d'Eg., p. 200. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 600 no. 63. — Aschers.-Schweinf. Ill. Flor. d'Eg. Supplem., p. 752. — *Geranium hirtum* Forsk. Flor. aeg.-arab., p. 123. — *Geranium crassifolium* Desf. Flor. Atlant. II, p. 111. — *Geranium crassum* Poir. Encycl. Suppl. II, p. 741. — An perennial herb, 10—25 cm high, sometimes somewhat more, glabrescent or more or less greyish-hirsute; root thick, branching, furnished with spheroidal to ovoid tubers; stems short, procumbent. Leaves triangular, bipinnatisect, segments decurrent, lobules short, oblong. Sepals glabrescent or grey-hairy, mucronate; petals pink, with a purple spot at the base, 8 mm to 1 cm long, once and a half as long as the calyx; beak 8 cm long, sixteen times as long as the carpels. — Flow. February to April.

M. ma. Marmarica: Matruqa; Dakalla; Bir Matruqa between Qatiya and El-Arish; Alexandria-West and East; Mandara; Abukir. — **M. p.** Rosetta; Damietta in deep sandy places. — **D. l.** Abu Roash; Pyramids of Giza. — **D. i** Wady-el-Arish. — **D. a. sept.** Not common in the mouths of the Wadies on calcareous ground.

Local name: tummeyr; timmeyr (Schweinfurth); bislis (G. Roth).

Also known from all the other parts of North Africa from Morocco to Arabia Petraea, Palestine and Syria.

810. (10.) **Erodium glaucophyllum** (L.) L'Herit Géraniol. (1787), no. 25. — DC. Prodom. I, p. 648. — Boiss. Fl. Or. I, p. 895. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 55 no. 237. — Sickenberg. Contrib. Flor. d'Eg., p. 200. — *Erodium glabrum* Pomel Nouv. Mat. Flor. Atlant., p. 342. — *Geranium glaucophyllum* L. Spec. Plant. I, p. 679. — ed. 2, p. 952. — Cav. Diss. IV, p. 222 tab. 92 fig. 2. — Burm. Spec. Geran., p. 43. — An perennial herb, 20—30 cm high, sometimes somewhat more, glaucous; root thick; stems prostrate, much forked. Leaves coriaceous, glabrescent or sparingly puberulent, oblong, crenate or obtusely incised-lobed toward the base. Sepals mucronate, appressed-hairy at the nerves; petals purple, 8 mm to 1 cm long, once and a half as long as the calyx; beak 8 cm long, slender, 10—14 times as long as the carpels. — Flow. February to March.

M. ma. N. v. D. l. D. a. sept. Not rare, often common in deep sandy places.

Local name: tummeyr; kabshîya (Forsk.); ka'kûl; lisân-el-hamal (Ehrenberg); murghey (Wilkinson).

Also known from Arabia Petraea and Palestine.

811. (11.) **Erodium arborescens** (Desf.) Willd. Spec. Plant. III (1800), p. 638. — DC. Prodom. I, p. 648. — Boiss. Flor. Or. I, p. 825. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 55 no. 236. — Sickenberg. Contrib. Flor. d'Eg., p. 200. — Murbeck Contrib. Fl. Nord-Ouest de l'Afrique, I, p. 54. — Knuth in Engler Pflanzenreich IV (1912) fasc. 129, p. 229. — Brumh. Mon. Erodium, p. 39. — *Erodium Hussons* Boiss. Diagnos. Plant. Orient., Ser. I fasc. VIII, p. 119. — *Geranium arborescens* Desf. Flor. Atlant. II, p. 110. — An perennial herb 15—40 cm high or more, scurfy; rhizome elongated, scaly; stems erect, slightly branched. Leaves coriaceous, ovate-cordate to ovate, obscurely lobed, crenate. Sepals woolly, mucronate; petals pink, with a deep purple spot at the base, 1.5 cm long, once and a half to twice as long as the calyx; beak 1.2 cm long, slender, 12—15 times as long as the carpels. — Flow. March to April.

D. l. Between Alexandria and Siwa. — D. a. sept. A characteristic plant of the Wadies on calcareous ground.

Local name: dahmeh (Schweinfurth); qarnâ (Wilkinson).

Also known from Arabia Petraea and Palestine. The plant varies from 10—60 cm in height, and the flowers increase in size as the fruit in forms.

812. (12.) **Erodium bryoniaefolium** Boiss. Diagnos. Plant. Orient., Ser. I fasc. I (1842), p. 61. — Flor. Or. I, p. 896. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 55 no. 238. — Sickenberg. Contrib. Flor.

d'Eg., p. 200. — Aschers. Flor. Rhinocol., p. 793 no. 62. — Knuth in Engler Pflanzenreich IV, fasc. 129 (1912) p. 226. — Brumh. Monog. Erodium, p. 78. — *Erodium guttatum* Ledeb. Flor. Ross. I, p. 478 not Willd. — *Erodium Kotschyannum* Koechel ex Boiss. Flor. Or. I, p. 896. — A perennial plant, 10—30 cm high, or sometimes somewhat more, stems procumbent, retrorse-woolly. Leaves silky-silvery, the radical somewhat plicate, cordate-ovate, obtusely crenate, undivided or trilobed or tripartite, the upper lobe often incised; upper leaves much smaller, more acute, lobed or parted. Sepals mucronate, woolly; petals pink, somewhat longer than the calyx; beak 6 cm long, slender, 8—10 times as long as the carpels. — Flow. January to March.

M. p. Ramlet-el-Ekhfên; Rosetta; Damietta in sandy places. — **D. l. D. i. D. a. sept.** Not rare on calcareous ground.

Local name: murgheyt.

Also known from Arabia Petraea and Sinai to India.

312. (4.) *Pelargonium* Linn.

Flowers irregular. Sepals 5, shortly united at the base and produced into a tube or spur, adnate to the pedicel. Petals 5 or fewer, the 2 upper ones different from the others (usually larger), and inserted on the sides of or behind the spur. Disk without glands. Stamens usually 10, hypogynous, shortly united, 5—7 or rarely only 2 or 3 bearing anthers, the remainder without anthers or rudimentary. Ovary and fruit of *Erodium*. Cotyledons flat or folded. — Herbs, undershrubs, or shrubs. Leaves opposite or rarely alternate, entire, toothed, lobed, or variously divided. Peduncles usually axillary, bearing an umbel of several flowers.

A very large genus, but which, with the exception of 3 N. African or Levant species and the 2 Australian ones, is confined to S. Africa.

813. *Pelargonium zonale* Willd. Spec. Plant. III (1800), p. 635. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 55 no. 2406. — Stem fleshy-frutescent. Leaves orbicular, cordate, shortly and obtusely lobed. Flowers in umbels on long peduncles, the pedicels glandular-pubescent. Petals bright red, the 2 upper shorter and narrower.

N. d. Tanta; Cairo; an occasional escape from cultivation.

Local name: khubbeyra; garniya.

Also known from the Cape. — Several other species of shrubby garden *Pelargonium* are very common or occasionally almost semi-naturalized. But the preceding species is the most generally or abundantly diffused.

48. **Oxalidaceae.**

Annual or perennial acaulescent or leafy-stemmed herbs or rarely shrubs, with rootstocks or scaly bulbs, and a sour sap. Leaves basal or cauline; petioles with free or adnate stipules or these obsolete; blades usually 3-foliate, sometimes 1-foliate, usually pinnate or digitate; leaflets commonly notched at the apex. Flowers perfect, essentially regular, solitary or in axillary or terminal, peduncled, umbel-like or dichotomous cymes. Calyx of 5 often unequal, imbricated, persistent sepals. Corolla of 5 white, pink, rose, purple or yellow convolute petals, usually broadened upward, entire or notched at the apex. Androecium of 10—15 stamens, or twice or thrice as many as the sepals. Filaments united below, in 2 sets of different lengths. Gynoecium of 5 united carpels. Ovary 5-celled, 5-lobed. Styles 5, distinct. Stigmas capitate. Ovules 2-many in each cavity. Fruit a globose or columnar loculicidal capsule, or rarely berry-like. Seeds with a dehiscent ariloid outer coat and a firm, often ridged, inner coat. Embryo straight in fleshy endosperm. Cotyledons flat.

A large order widely spread throughout the temperate zones of both hemispheres.

- A. Leaves all digitate 1. **Oxalis**.
 B. Leaves all pinnate 2. **Biophytum**.

313. (1.) **Oxalis** Linn.

Flowers regular. Sepals 5, imbricate. Petals 5. Stamens 10, all antheriferous, free or slightly connate at the base. Ovary 5-lobed, 5-celled, with 5 distinct styles and capitate subcapitate, or emarginate stigmas; ovules 1- ∞ . Capsule dehiscent loculicidally; valves persisting around the axis or spreading and free. Seeds albuminous, with a crustaceous testa. — Herbs, acaulescent or caulescent, rarely shrubby. Leaves radical or cauline, alternate, 3-foliate or abruptly pinnate and multifoliate, rarely with stipular appendages. Peduncles radical or axillary, with 1 or more (usually umbellate) flowers, yellow white or red.

A large and widely-spread genus in both hemispheres, with upwards of 100 species, peculiar or nearly so to the Cape, and a few widely disseminated tropical or subtropical weeds.

- A. Root bulbous; stemless 1. **O. cernua**.
 B. Root fibrous; stems branched 2. **O. corniculata**.

814. (1.) **Oxalis cernua** Thunberg Flor. Cap. I (1807—1813), p. 348. — and Diss. Gen. Ox., no. 12 tab. 2. — Boiss. Flor. I, p. 867.

— Aschers.-Schweinf. Illustr. Flor. d'Eg., p. 54 no. 224. — Sickenberg. Contrib. Flor. d'Eg., p. 198. — Willd. Spec. Plant., p. 46. — DC. Prodr. II, p. 72. — *Oxalis libyca* Viv. Flor. Libyc., p. 82. — Stemless, or shortly stipitate; leaves on long, terete, glabrous petioles; leaflets obcordate-bilobed, glabrous at each side, or villous underneath; scapes elongate, glabrous; pedicels downy, the younger cernuous, erect in flower; sepals lanceolate, bicallous at the apex, 5-times shorter than the golden-yellow corolla. Capsule always aborting. — Flow. March to April.

Local name: lasal.

N. d. Damanhur; Qalyub; Cairo. — **N. v.** Esne, naturalized.

Indigenous at the Cape; from there brought to Malta 1806; probably propagated with the culture of the Mandarin, now naturalized in the Mediterranean region of Europe and Africa, the Canary Islands and Australia. See Henslow Proceed. Linn. Soc. 1890-1891, p. 35 and Sickenberger Contrib. Flor. d'Eg., p. 198, who notes that in Egypt not only the generally distributed microstylous form is found, but also at Cairo (Botan. Garden) the macrostylous one.

815. (2.) ***Oxalis corniculata*** L. Spec. Plant. I (1753), p. 623. — Boiss. Flor. Or. I, p. 866. — Sibth. and Sm. Flor. Graec., tab. 451. — Rehbch. Ic. V, fig. 4896. — *Oxalis villosa* MB. Flor. Taur. Cauc. I, p. 355. — DC. Prodr. I, p. 692. — *Oxalis procumbens* Steud. in Rich. Flor. abyss. I, p. 123. — A diffuse, procumbent or ascending, branched, pubescent or shortly pilose herb, with a fibrous root. Leaves very various in size, 3-foliolate, on slender petioles of 2 to 6 cm or more; leaflets obcordate-cuneate, with rounded lobes. Stipules minute, adnate to the base of the petiole or obsolete. Peduncles axillary, 1—4-flowered, shorter or longer than the leaves. Flowers yellow. Capsule subcylindrical, pubescent, pointed, 5—8 times longer than the sepals. — Flow. March to April.

M. ma. N. d. N. v. O. Common on alluvial soil.

Local name: hamd; hommeyd; hamd helwa (Ascherson); adba (Schweinfurth).

A Cape species.

314. (2.) ***Biophytum*** DC.

Annual or rarely perennial herbs, with simple or branched stems. Leaves abruptly pinnate, fascicled or almost whorled at the top of the stem; leaflets opposite, oblique; petiole swollen at the base. Peduncles terminal; pedicels umbelled. Flowers small, yellow rarely purple. Sepals 5, lanceolate, acuminate. Petals 5. Stamens 10, filaments free, 5 outer smaller. Styles 5, stigmas notched at the

apex or 2-fid. Capsule ovoid or oblong or subglobose, splitting loculicidally sometimes to the base into 5 spreading valves. Seeds as in *Oxalis*.

A small genus widely distributed in Tropical Asia, Africa and America. Species about 25; various species have sensitive leaves, which and the leaflets, close downwards. The flowers are dimorphous as regards the relative length of the styles and stamens.

816. **Biophytum sensitivum** DC. Prodrum. I, p. 690. — *Biophytum Petersianum* Klotzsh in Peters Mossamb. Bot., p. 81 tab. XV. — Either acaulescent or with an erect, usually unbranched, herbaceous or wiry stem, a few cm to 30 cm in height. Leaves spreading in a terminal rosette or crown, abruptly pinnate; rhachis usually pubescent or hispidulous; leaflets in 6—14 sessile pairs, the upper pairs often larger, obliquely quadrate-rotundate rhomboid-oblong or the lower subdeltoid, base more or less truncate, more or less coriaceous, glabrous, the oblique or diagonal midrib and lateral veins often prominent beneath. Flowers in sessile, crowded or pedunculate, bracteate heads. Peduncles rarely much exceeding the leaves. Flowers on very short pedicels, exceeding or equalling the subulate bracteoles, yellow or red. Sepals linear-lanceolate, attenuated to a fine point, 5—7-nerved, exceeding the capsule. Styles varying in relative length, probably with other dimorphic conditions, shorter or longer (to twice as long) than the ovary, sparsely hairy, undivided. — Flow. March.

N. v. Luksor, as a weed in gardens.

Also known from tropical Africa and Asia.

49. Tropaeolaceae.

Flowers perfect, irregular. Sepals 5 coloured persistent, spurred, slightly imbricate in the bud. Petals 5, alternate with the sepals unequal, often clawed sometimes abortive folded together and convolute in the bud. Stamens 8—10, free, inserted on the receptacle yet almost perigynous. Ovary mostly 3-celled, 3-lobed, rarely 2—5-celled, 2—5-lobed; ovules 1 in each cell; style 1; stigmas 3 or 2. Fruit not bursting, spongy, dry or baccate. Carpels mostly 3, attached to the base of the style, 1-celled, 1-seeded. Seeds large without albumen. Embryo large with thick finally conferruminate cotyledons eared at their base and a short radicle next the hilum. — Smooth trailing plants with showy flowers and pungent cress-like flavour, of a juicy tender substance and quickly withering. Leaves alternate without stipules. Flowers axillary, solitary.

A small order of only one genus in Southern America.

315. **Tropaeolum** Linn.

Calyx 5-partite, lobes equal, the upper ones spurred. Petals 5 unequal, the 3 lower ones smaller or abortive. Stamens 8, wholly distinct or free. Fruit spongy or cooky of 3 (by abortion 1 or 2) indehiscent 1-seeded kidney-shaped carpels ribbed and rounded at the back.

A small genus in the South America. One species cultivated everywhere.

817. **Tropaeolum majus** L. Spec. Plant. I (1753), p. 681. — DC. Prodrum. I, p. 683. — Spreng. System. II, p. 236. — Whole plant smooth juicy and succulent with long trailing fleshy brittle stems. Leaves glaucescent, throwing oft water like drops of quicksilver. Flowers large, orange, more or less approaching to red, streaked with deep blood-red, and so together with their shape suggesting to Linnaeus the name of Trophy-Flowers. — Flow. February to March.

N. d. N. f. N. v. Everywhere cultivated in gardens and often semi-naturalized.

Local name: tartûr-el-bâsha.

Originally from South America, propably, from Patagonia.

50. **Linaceae.**

Flowers regular, hermaphrodite. Sepals 5, rarely 4, free or united at the base, imbricate or rarely almost valvate. Petals as many, hypogynous or rarely slightly perigynous, imbricate, usually contorted. Stamens as many as petals or twice or rarely thrice as many, united into a ring or short tube at the base; anthers 2-celled, with parallel cells opening longitudinally. Glands 5, adnate to or embedded in the outside of the staminal tube or rarely wanting. Disk none (besides the staminal tube). Ovary free, entire, 3—6-celled. Ovules 2 or rarely 1 in each cell, pendulous, anatropous, with a ventral raphe. Styles 3—5, distinct or more or less united, with terminal usually capitate stigmas. Fruit either a capsule, separating into cocci, usually dehiscent, or a drupe, with as many pyrenes as carpels, or more frequently reduced by abortion to 1. Seeds 1 or 2 in each coccus or pyrene; testa membranous or almost coriaceous; albumen fleshy, abundant or thin or entirely wanting. Embryo usually straight, with flat, ovate cotyledons; radicle superior. — Herbs, shrubs, or rarely trees, glabrous or rarely hirsute or tomentose. Leaves alternate or very rarely opposite, simple and entire or slightly serrate. Stipules lateral or within the petiole, sometimes minute or wanting.

An Order formerly almost limited to the genus *Linum*, but lately extended to include several small Orders or genera, chiefly tropical, from both the New and the Old World.

316. *Linum* Linn.

Sepals 5. Petals 5, contorted, without appendages. Stamens 5, perfect; staminodia as many, alternating with the stamens, minute, tooth-like or hair-like, or sometimes scarcely conspicuous. Glands 5, small, scarcely prominent on the staminal tube, opposite the petals. Ovary 5-celled, with 2 collateral ovules in each cell. Capsule dividing into 5 cocci, with 2 seeds in each separated by an imperfect partition, or into 10 1-seeded cocci when the partition is more complete. Albumen thin. — Herbs. Leaves narrow, entire. Stipules none or minute and gland-like.

A large genus, widely distributed over the temperate or warmer extra-tropical regions of the globe, with a few tropical American species.

A. Petals yellow.

I. Stigma clavate. 1. *L. maritimum*.

II. Stigma capitate 2. *L. strictum*.

B. Petals blue or pink, free or somewhat united by claws.

I. Fruiting pedicels short. Sepals glandular.

Claws of the petals somewhat united . . 3. *L. pubescens*.

II. Fruiting pedicels long. Sepals destitute of glands.

a) Flowers 3 cm long 4. *L. grandiflorum*.

b) Flowers 1—2 cm long.

1. Decumbent or prostrate herbs . . . 5. *L. decumbens*.

2. Erect herbs.

α) Sepals as long as the capsule . . 6. *L. usitatissimum*.

β) Sepals shorter than the capsule . 7. *L. humile*.

818. (1.) *Linum maritimum* L. Spec. Plant. I (1753), p. 400. — Boiss. Flor. Or. I, p. 851. — Jacq. Hort. Vindob. II, tab. 154. — Rehbch. Ic., fig. 5172. — A perennial herb, 20—40 cm high or more, glabrous; stems elongate, virgate; panicles corymbose; branches elongate; leaves trinerved, the lower ones opposite elliptical, the upper ones alternate, lanceolate; sepals ovate broadly acuminate four times shorter than the corolla, as long as the capsule; stigma clavate. — Flow. March to April.

M. ma. Mariut-Kinghi.

Also known from the Mediterranean part of Europe and Northern East Africa.

819. (2.) *Linum strictum* L. Spec. Plant. I (1753), p. 400. — Boiss. Flor. Or. I, p. 852. — Aschers.-Schweinf. Prim. Flor. Marmaric., p. 599 no. 57. — *Cathartolinum strictum* Rehbch. Ic. V, fig. 5170 to

5170b. — An annual plant, 30—50 cm high, or sometimes somewhat more, glabrous; stem at first slender, becoming stout and stiff, corymbose. Leaves crowded, linear-lanceolate, acute, very rough. Flowers 5 mm long; fruiting pedicels thickened, shorter than the capsule; sepals lanceolate, acuminate, two-thirds as long as the 5 mm long corolla, twice as long as the capsule. — Flow. March to April.

M. ma. Mariut-Kinghi.

Also known from all the other parts of the Mediterranean region.

820. (3.) **Linum pubescens** Russel Flor. Alepp. II (1756), p. 268. — Boiss. Flor. Or. I, p. 860. — Sibth. and Smith Flor. graec., tab. 302. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 54 no. 221. — *Linum hirsutum* Prodom. Flor. graec., tab. 303 not Lin. — *Linum Sibthorpium* Reut. and Marg. Mem. Soc. Phys. Gen. VIII, p. 283 tab. 3. — *Linum piliferum* Presl. Flor. Sic., p. 171. — *Linum decoloratum* Griseb. Spicileg. I, p. 117. — Whole plant hirsute-setulous; branching from the base; stems terete, erect; leaves 3—5-nerved, oblong, obtuse; the upper-ones oblong-lanceolate, acute; cymes often composed with elongated branches; sepals nervose, linear-lanceolate three times shorter than the rose-coloured corolla, as long as the capsule. — Flow. February to March.

D. i. Sâlihiya; el-'Arîsh.

Also known from Sicily and Syria.

821. (4.) **Linum grandiflorum** Desf. Flor. Atlant. I (1798), p. 102. — Aschers.-Schweinf. Ill. Flor. d'Eg. Supplem., p. 751. — A perennial plant, 30—40 cm high or sometimes more glabrous; stems herbaceous from a shrubby base, acutely angled above. Leaves obovate-lanceolate 2—3-nerved, to lanceolate and linear, acute. Branches of cyme forked, nearly equal; sepals lanceolate, not glandular margined, acuminate, one-third as long as the 3 cm long, pink corolla, once and a half as long as the capsule. — Flow. March to April.

N. d. Cairo, naturalized.

Also known from Algeria.

822. (5.) **Linum decumbens** Desf. Flor. Atlant. I (1798), p. 278 tab. 79. — Boiss. Flor. Or. Supplem., p. 139. — Rehbch. Ic. VI fig. 5163b. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 54 no. 220. — Sickenberg. Contrib. Flor. d'Eg., p. 198. — *Linum rubrum* Rafin. Nov. Gen. Spec. Sicil., p. 74. — An annual or perennial plant, branching from the base, decumbent or ascendent or erect; the lower leaves linear-subulate, 3- or 5-nerved, asperulous at the margin, acute, erect;

flowers in corymbs; peduncles twice as long as the calyx, subangulate. the fructiferous erect, suffulte; sepals broadly ovate, scarious at the margin, ciliate to the tip, trinerved; petals rose-coloured twice as long as the calyx; capsule globose, mucronate, erect, somewhat shorter than the calyx. — Flow. March to April.

M. ma. Mariut; Montaza.

Also known from Morocco, Algeria, Tunisia; Middle Italy and Sicily.

823. (6.) **Linum usitatissimum** L. Spec. Plant. I (1753), p. 397. — Boiss. Flor. Or. I, p. 861. — Rehbch. Ic. VI, fig. 5155. — A tall, erect annual, perfectly glabrous, and usually branched only at the top. Leaves alternate, erect, narrow lanceolate, pointed and entire, 2—2½ cm long. Flowers of a rich blue, in a loose terminal corymb. Sepals obovate or lanceolate, all pointed. Petals obovate, entire or slightly crenate, 8 or 18 mm long. Capsule globular or slightly depressed. — Flow. December to March.

N. d. Cultivated and often semi-naturalized.

Local name: kittân.

An extensively cultivated plant whose origin is unknown, but it readily sows itself as a weed of cultivation in Europe, Asia and other parts of the world, and as such it is met in some parts of Egypt.

824. (7.) **Linum humile** Mill. Dict. (1724), no. 2. — Boiss. Flor. Or. I, p. 861. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 54 no. 222. — Sickenberg. Contrib. Flor. d'Eg., p. 119. — An annual plant, 20—30 cm high, stem erect. Leaves flat, linear-lanceolate, acute. Sepals ovate, acuminate, 3-nerved, ciliate, one-third as long as the deep blue corolla, a little shorter than the capsule, one half to one-third as long as the deep blue, entire petals; inner margin of the septa of the capsule ciliate. — Flow. March to April.

N. d. Cultivated and often naturalized.

Also known from Syria, Asia Minor and Persia.

51. Zygophyllaceae.

Flowers usually hermaphrodite and regular. Sepals 5 or 4, very rarely 6, free or connate at the base, imbricate or rarely valvate in the bud. Petals as many, free, imbricate or contorted, rarely valvate or wanting. Disk convex or depressed, rarely annular or undeveloped. Stamens usually the same or twice the number of the petals, the filaments most frequently with a scale or wings at or below the middle; anthers 2-celled, opening longitudinally. Ovary sessile or shortly stalked, often angular, with as many cells as petals or sepals, rarely more or fewer; style simple, with a simple

or rarely lobed stigma. Ovules 2 or more in each cell, rarely solitary, pendulous or ascending, with a ventral raphe. Fruit sometimes drupaceous, never beccate, more usually separating into indehiscent or 2-valved cocci, the endocarp occasionally separating. Seeds solitary or rarely several, pendulous; testa membranous, crustaceous, or thick and mucilaginous when wetted; albumen usually thin. Embryo as long as the seed, green, straight, or rarely curved; cotyledons oblong or linear, radicle short, superior. — Shrubs, undershrubs, or herbs, the branches usually divaricate and articulate at the nodes. Leaves opposite, or rarely alternate by the abortion of 1 of each pair, 2-foliate or pinnate, rarely simple, the leaflets usually entire. Stipules in pairs. Peduncles axillary, 1-flowered, or rarely branching into cymes. Flowers mostly white, yellow, or red.

A small Order, nearly allied on the one hand to Malpighiaceae, on the other to Geraniaceae and Rutaceae, dispersed chiefly over the subtropical regions of both the Old and New World, and most abundant in dry desert or saline regions. The seven Egyptian genera are all common to Africa and Asia, and one of them extends also to Europe and America.

A. Embryo without albumen or nearly so.

I. Leaves stipuled.

- a) Petals and stamens 4. Dwarf herb with minute spiked flowers 1. *Tetradiclis*.
- b) Petals 5. Stamens 12—15. Flowers 3 cm broad, white, terminal 2. *Peganum*.

II. Leaves exstipulate.

- a) Fruit separating into indehiscent carpels . . . 3. *Tribulus*.
- b) Fruit an inversely pear-shaped, unarmed drupe, with bony endocarp 4. *Nitraria*.

B. Embryo albuminous.

- I. Petals 0 5. *Seetzeenia*.

II. Petals 4—5.

- a) Stipules not spinescent 6. *Zygophyllum*.
- b) Stipules spinescent 7. *Fagonia*.

317. (1.) *Tetradiclis* Stev.

Calyx 4-parted, persistent. Petals 4, short clawed, persistent. Disk inconspicuous. Stamens 4, with awl-shaped, persistent filaments. Ovary 4-angled, 4-celled, depressed at the centre. Placentae free, filiform, suspended from angle, ascending. Capsule 4-angled, valves grooved, loculicidal; cells divided into 3 compartments by partitions from the endocarp, the lateral 1-seeded, the middle with 4 seeds

or less; seeds minute, oblong, with thin testa, little albumen and straight embryo. — Small, fleshy herbs with aspect of Peplis.

A small genus in the Mediterranean region.

825. **Tetradiclis salsa** C. A. Mey. Verzeichn. d. Pflanz. Caucas. (1831), p. 226. — Boiss. Flor. Or. I, p. 918. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 57 no. 261. — Sickenberg. Contrib. Flor. d'Eg., p. 201. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 600 no. 66. — Suaeda pinnatifida Del. Illustr. Flor. d'Eg., p. 57 no. 298 tab. I fig. 5. — An annual plant, 10—20 cm high, sometimes somewhat more, branching from the neck. Leaves pinnatisect, the floral one lobed at the base. Flowers in spike-like, scorpioid racemes. — Flow. March to April.

M. ma. Marmarica: Matruqa; Abusir; Alexandria-West and -East, along the coast in deep sandy places.

Also known from Tripolitania, Syria, Mesopotamia, Transcaucasia and Middle Russia. — Extremely common in salt spongy soil, growing in dense moss-like clusters, in shade; the fleshy leaves much resemble those of many salsolaceous plants.

318. (2.) **Peganum** Linn.

Calyx 5-parted, persistent, open in bud. Petals 5, imbricated. Stamens 12—15, inserted with petals at base of short disk, naked, dilated at base. Ovary globular, 3—4-celled. Style triangular. Ovules numerous, suspended at central angle by a short funicle. Capsule 3-valved, loculicidal. Seeds angular, with a spongy shell. — Erect herbs or shrubs, with irregularly dissected leaves, bristle-shaped, minute stipules, and terminal white flowers opposite the leaves.

A small genus in the Mediterranean region.

826. **Peganum Harmala** L. Spec. Plant. I (1753), p. 638. — Boiss. Flor. Or. I, p. 917. — Rehbch. Ic. V, fig. 4818. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 57 no. 260. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 752. — Aschers. Flor. Rhinocol., p. 793 no. 68. — A shrubby plant, 50 cm to 1 m high, or sometimes somewhat more, glabrous; stems herbaceous, forked, branched, corymbose. Lobes of leaves linear, acute. Petals oblong-elliptical, somewhat shorter than the calyx; capsule erect, depressed at tip. — Flow. December to April.

M. ma. Marmarica: Matruqa; A common shrub over the whole coast from Abusir to Abukir, in deep sandy places, everywhere. — **M. p.** Rosetta; Damietta; el-'Arish; Sheyk-Zoeyd; common everywhere in deep sandy places and on sand-dunes. — **D. a. sept.** A very characteristic shrub in the mouth of the Wadies, in sandy places.

Local name: ghalqet-ed-dib (Forsk.); khargheyl (Schweinfurth); karemlân (Schweinfurth); generally: harmal.

Also known from other parts of Northern Africa and South Europe, eastward to Persia. — A very common string scented shrub over the whole country. The natives everywhere seem to hold it in some superstitious awe.

319. (3.) *Tribulus* Linn.

Sepals 5, rarely 6. Petals as many, flat. Disk annular, 10-lobed or sinuate, with a gland at the base of each of the inner stamens, alternating with the petals. Stamens twice as many as petals, the filaments filiform, without appendages. Ovary of 5 or sometimes more cells, with 1 or 2—5 superposed ovules in each cell. Fruit separating into as many cocci as carpels, hard, indehiscent, and each usually bearing 2 or more prickles or tubercles. — Herbs, usually prostrate or divaricate and hairy. Leaves abruptly pinnate, opposite, with one of each pair smaller than the other, or sometimes abortive or all alternate. Stipules small, lanceolate, or falcate. Pedicels solitary in the axil of the smaller leaf of each pair, or opposed to the leaf when alternate. Flowers white or yellow.

The genus is dispersed over the greater part of the tropical and warm regions of the globe, extending into Europe and N. America.

A. Petals longer than the calyx.

a) Stigma longer than the style or as long as 1. *T. bimucronatus*.

b) Stigma sessile 2. *T. terrestris*.

B. Petals as long as the calyx. 3. *T. alatus*.

C. Petals shorter than the style 4. *T. macropterus*.

827. (1.) *Tribulus bimucronatus* Viv. Dec. Plant. Aeg. (1830), p. 9 tab. 2 fig. 4. — Boiss. Flor. Or. I, p. 901. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 55 no. 241. — Sickenberg. Contrib. Flor. d'Eg., p. 200. — *Tribulus pentandrus* Forsk. Flor. aeg.-arab. Deser., p. 88. — *Tribulus sinaicus* Boiss. Diagnos. Plant. Or., Ser. I fasc. VIII p. 120. — *Tribulus spurius* Kralik in Ann. Scienc. Nat., Sér. III vol. XI p. 28. — *Tribulus intermedium* Kralik in Ann. Scienc. Nat., Ser. III vol. XI p. 28. — 30—50 cm high or more, appressed-canescens. Petals obovate, somewhat longer than the calyx; stamens 5, rarely 10; stigma capitate or ovate, as long as or longer than the style; carpels appressed-hairy or canescens, round at the back, rough-warty, with 4 prickles, the lower often reduced to tubercles. — Flow. March to April.

D. a. sept. D. a. mer. Characteristic of the drifting sand-hills at the mouths of the Wadies.

Also known from Syria and Palestine.

828. (2.) **Tribulus terrestris** L. Spec. Plant. I (1753), p. 554. — Boiss. Flor. Or. I, p. 902. — Rehbch. Ic. V, fig. 4821. — DC. Prodr. I, p. 703. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 55 no. 243. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 752. — Sickenberg. Contrib. Flor. d'Eg., p. 200. — Aschers. Flor. Rhinocol., p. 793 no. 64. — A prostrate annual or biennial, more or less hirsute or silky-hairy, especially the young shoots, the stems extending often to 30—70 cm. Leaves opposite, unequal; leaflets of the larger one usually 5—7 pairs, obliquely oblong, 6—12 mm long. Pedicels shorter than the opposite larger leaf. Flowers small, the sepals rarely attaining 5 mm and often much less, the petals rather longer, but very rarely nearly twice as long. Anthers 10, all small and perfect. Ovules 3 or 4 in each cell. Cocci 5, hard, 5—8 mm long, glabrous or hairy, rounded on the back, with 2 marginal, divaricate, horizontal, subulate or conical prickles about half-way up, and often 2 smaller reflexed ones lower down, the rest of the surface usually tuberculate or shortly muricate. Seeds 2—4 in each coccus, horizontal and separated by transverse partitions. — Flow. December to March.

M. ma. Abusîr; Alexandria-West and -East; Mandara; Abukîr, common in deep sandy places. — **M. p.** El-'Arish. — **N. d.** Matariya; Cairo; Luksor.

Local name: gatha.

Also known from all the other parts of the Mediterranean region and Middle-East-Europe.

829. (3.) **Tribulus alatus** Del. Illustr. Flor. d'Eg. (1813), no. 438. — Boiss. Flor. Or. I, p. 902. — Ic. Viv. Dec. aeg., tab. 2 fig. 5. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 54 no. 243. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 752. — Sickenberg. Contrib. Flor. d'Eg., p. 200. — *Tribulus longipetalus* Viv. Dec. aeg., tab. 2 fig. 6 p. 10. — An annual herb. Appressed canescent. Petals obovate-oblong, as long as or longer than the calyx; stamens 10; stigma ovate-capitate, as long as the style or shorter; carpels hairy, with warty, more or less keeled back, bordered on both sides by a wing cut into triangular spines, and more or less dentate, narrower than the diameter of the carpel. — Flow. March to April.

D. l. D. i. D. a. sept. A characteristic plant in sandy places.

Local name: gatha; dreys (Forsk.); khershûm-en-naqeh (Delile); ummgraisy (Schweinfurth).

Also known from Arabia Petraea and Syria.

830. (4.) **Tribulus macropterus** Boiss. Diagnos. Plant. Orient., Ser. I fascic. I (1842), p. 61. — Flor. Or. I, p. 903. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 55 no. 244. — Sickenberg. Contrib. Flor.

d'Eg., p. 200. — *Tribulus pterocarpus* Ehrenb. Mss. in Herb. Berol. — Koernicke in Müll. Ann. IV, p. 409. — Decandrous, densely villous, canescent; petals obovate-oblong as long as the calyx; stigma small cylindrical-pyramidal as long as the style; carpels hirsute, convex, tuberculate. — Flow. March to April.

O. Little Oasis; Farâfra; Dakhel; Great Oasis. — **D. l.** Es-Sabrigât; Beni-Selâma; Pyramids of Giza; between Gebel Gara' and Bibân. — **D. a. sept.** Serapeum; Bîr Suez; Suez. — **D. a. mer.** Qoseyr.

Local name: gudub; daqan-esh-sheykh (Klunzinger); qatba; qotâba; ummgraisy (Schweinfurth).

Also known from tropical Arabia.

320. (4.) *Nitraria* Linn.

Calyx small, 5-lobed. Petals 5, concave with inflexed points, induplicate-valvate in the bud. Disk not prominent. Stamens 15, rarely 10—14, the filaments free, without appendages. Ovary sessile, 2—6-celled, terminating in a short thick style, with 2—6 adnate stigmas; ovules solitary in each cell, ascending from pendulous funiculi, which are more or less adnate to their inner face. Fruit a drupe, with a berry-like sarcocarp; putamen ovoid-acute, hard, marked outside with irregular depressions, and opening at the top in 6 short, pointed valves, of which 3 inner ones smaller. Seeds solitary, pendulous, without albumen. — Rigid shrubs, often thorny. Leaves alternate or clustered, undivided, succulent. Stipules small. Flowers small, white, in once or twice-forked scorpioid cymes.

The genus, besides the widely-spread Egyptian species, comprises one other from Australia. The rhaphe of the seed is described as dorsal by Spach, but we have always found it ventral in the ovary, although the seed sometimes hangs obliquely.

831. *Nitraria retusa* (Forsk.) Aschers. in Verhandlg. Bot. Ver. Prov. Brandbg. XVIII (1876), p. 94. — Aschers. Flor. Rhinocol., p. 793 no. 69. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 57 no. 262. — Aschers. Flor. Sirb., p. 811 no. 8. — Sickenberg. Contrib. Flor. d'Eg., p. 201. — *Nitraria tridentata* Desf. Flor. Atlant. I, p. 372. — Boiss. Flor. Or. I, p. 919. — *Nitraria senegalensis* Lam. Ill., tab. 403 fig. 2. — *Peganum retusum* Forsk. Flor. aeg.-arab. Descr., p. 60. — Decsne Flor. sin., p. 37 no. 196. — Jaub. and Spach Illustr., tab. 293. — *Nitraria sericea* Jaub. and Spach Illustr., tab. 294. — An shrub, 1—3 m high. Leaves wedge-shaped, entire, retuse, or 3—5-crenate at the tip. Flowers long pedicelled, 4—5 mm long, fragrant, greenish-white. Fruit edible. — Flow. December to April.

M. ma. M. p. N. d. O. D. l. D. i. D. a. sept. D. a. mer. R.

Grows abundantly everywhere in clay soil, on the sides of low hills, that are otherwise quite barren.

Local name: gharqad; ghardaq; sahanûn (Klunzinger); the fruits: 'aneb-ed-dîb.

Also known from Algeria, Tunisia, Tripolitania, Palestine to Persia. — A shrub from 1—3 m in height; stems and branches white, and with its fleshy leaves and spinous branches very like a *Lycium*. One of the few shrubs that is not brooded by camels.

321. (5.) *Seetzeenia* R. Br.

Sepals 5, oblanceolate, acute, valvate, deciduous. Petals 0. Stamens 5; filaments filiform, naked. Ovary oblong-clavate, 5-sulcate. Styles 5, short, radiating or recurved; stigmas capitellate. Ovules solitary, pendulous. Fruit of five 1-seeded crustaceous cocci, separating septicidally. — Prostrate herb from a shrubby base or thick woody rootstock. Leaves opposite, 3-foliate, with interpetiolar stipules. Flowers small, axillary, solitary.

Based upon a single wide-spread species, occurring at the Cape and from N. Africa eastward to N.W. India.

832. *Seetzeenia orientalis* Decsne Flor. sin. in Ann. Scienc. Nat., Ser. 2 Vol. III (1835), p. 281 tab. 7. — Boiss. Flor. Or. I. p. 917. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 56 no. 259. — *Seetzeenia africana* R. Br. in Denh. and Clapp. App. 26. — *Zygothymum prostratum* Thunberg sec. Sond. Flor. Cap. I, p. 366. — Papillose or smooth. Leaflets fleshy, apiculate, the median obovate-cuneate, lateral oblique, 4 mm long, more or less, rarely 1 cm, exceeding or equalling the petiole. Peduncles 2—3 mm, at length more or less recurved at the apex. Fruit ellipsoid or subglobose, the carpels separating longitudinally and exposing the smooth crustaceous endocarp more and more as it matures, 5—6 mm long. — Flow. March to May.

D. a. sept. Suez, at Adjerud (Letourneux). — **D. a. mer.** Between Bir Ambar and Leyeta; Qoseyr.

Local name: habeyn (Klunzinger).

Also known from the Cape, the other parts of North Africa and NW.-India.

322. (6.) *Zygothymum* Linn.

Sepals 4 or 5. Petals as many, flat, contracted into a short claw. Disk concave, angular or cup-shaped. Stamens twice as many as petals, inserted at the base of the disk; filaments filiform, with an

aduate scale or wing-like appendage at the base, which however is wanting in some species. Ovary sessile, 4 or 5-angled, narrowed at the top into an angular style, 4 or 5-celled, with 2 or more superposed ovules in each cell. Fruit capsular, with 4 or 5 angles or vertical wings, indehiscent or separating into cocci or opening loculicidally, the endocarp sometimes separating. Seeds 1 or more in each cell, pendulous; albumen scanty. — Shrubs or undershrubs, often prostrate. Leaves opposite, with 2 distinct leaflets or rarely 2-lobed or simple, frequently fleshy. Stipules small. Peduncles 1-flowered, axillary, solitary, or rarely 2 together. Flowers white or yellow.

A considerable and widely-spread genus, though confined, with one exception, to the Old World, and chiefly numerous in the desert or saline regions of central and western Asia, North and South Africa.

- A. Capsule with wings as broad as or broader than the cells 1. *Z. dumosum*.
- B. Capsule angled, wingless.
 - I. Leaves simple 2. *Z. simplex*.
 - II. Leaves composed; leaflets flat.
 - a) Peduncles shorter than the flower 3. *Z. fabago*.
 - b) Peduncles longer than the flower 4. *Z. decumbens*.
 - III. Leaves composed; leaflets terete.
 - a) Cobwebby-canescient 5. *Z. album*.
 - b) Glabrous 6. *Z. coccineum*.

833. (1.) **Zygophyllum dumosum** Boiss. Diagnos. Plant. Orient., Ser. I fasc. VIII (1849), p. 125. — Flor. Or. I, p. 911. — Sickenberg. Contrib. Flor. d'Eg., p. 201. — A shrubby plant, 30 cm to 1.5 or 2 m in height, appressed-canescient; branches tortuous, short. Leaflets terete, oblong-cylindrical, nearly as long as the petiole. Peduncles slender, axillary, as long as the calyx, lengthening in fruit; sepals five, hairy, oblong; petals five, oblong-spathulate, twice and a half as long as the calyx; scales round-ovate, obtuse, denticulate at the apex; capsule 1 cm broad, oblate-spheroidal; carpels 5, free almost to axis, flattened, wing somewhat broader than the cell. — Flow. March to April.

D. i. Desert el Tih, in deep sandy places.

Also known from Arabia Petraea and Syria.

834. (2.) **Zygophyllum simplex** L. Mant. I (1767), p. 68. — Boiss. Flor. Or. I, p. 912. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 56 no. 254. — *Zygophyllum portulacoides* Forsk. Flor. aeg.-arab., p. 88 tab. 12 fig. B. — An annual plant 20—40 cm high, sometimes somewhat more, glabrous, prostrate, herbaceous, branching from the

base. Leaves simple, sessile, cylindrical, 5 mm to 1 cm long, fleshy, obtuse. Peduncles as long as the calyx; sepals obovate; petals yellow spathulate; scales biparted; capsule 2 mm broad, wrinkled, top-shaped, deeply parted into 5, flattened carpels. — Flow. December to March.

D. l. D. i. D. a. sept. D. a. mer. A characteristic plant of the sandy deserts.

Local name: garmal.

Also known from Fezzan, Arabia, Nubia and Cap of the Good Hope.

835. (3.) **Zygophyllum Fabago** L. Spec. Plant. I (1753), p. 551. — Boiss. Flor. Or. I, p. 913. — Lam. Illustr., tab. 345 fig. 1. — A shrub, 50 cm to 1 m high; glabrous, erect, herbaceous. Leaflets obovate-oblong, 3 cm long, longer than the petiole. Peduncles somewhat shorter than the calyx; sepals oblong, 1 cm long, nearly as long as the wedge-shaped, retuse petals; scales fringed, papillary; capsule 3 cm long, oblong-cylindrical, acutely 5-angled. — Flow. March to April.

D. a. sept. Wady Dugla; Wady Rished near Helwân.

Also known from Arabia Petraea and Syria to Persia.

836. (4.) **Zygophyllum decumbens** Delile Illustr. Flor. d'Eg. (1813), p. 77 tab. 27 fig. 3. — Boiss. Flor. Or. I, p. 914. — DC. Prodrum. I, p. 705. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 56 no. 255. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 752. — Much branching, decumbent, woody below, glabrous. Leaves unijugate, fleshy; leaflets plane, obovate to oblanceolate, very obtuse, 5—8 mm long; petioles equalling or slightly exceeding the leaflets. Flowers numerous. Peduncles 0.5—2 cm, at length deflexed. Sepals obovate, cucullate, nearly equalling the oblong-spathulate white petals. Staminal scales deeply 2-fid with acute teeth. Capsule deeply 5-lobed, turbinate; apex entire, the carpels coherent to the extremity of the fruit, 4—6 mm long, 4—6 mm broad. — Flow. March to April.

D. a. sept. Cairo; Suez. — **D. a. mer.** Ras-Benâs (Schweinfurth).

Local name: buzz-el-kelbeh (Schweinfurth).

Also known from Soturkei.

837. (5.) **Zygophyllum album** L. Spec. Plant. ed. II (1762), p. 552. — Boiss. Flor. Or. I, p. 915. — DC. Plant. Grass., tab. 154. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 56 no. 256. — Sickenberg. Contrib. Flor. d'Eg., p. 201. — Aschers.-Schweinf. Prim. Flor. Marmaric., p. 600 no. 67. — Aschers. Flor. Sirbon., p. 811 no. 7. — Aschers. Flor. Rhinocol., p. 793 no. 67. — *Zygophyllum proliferum* Forsk. Flor. aeg.-arab. Descr. 87, tab. 12 A. — DC. Prodrum. I, p. 706. — A minutely papillose-pubescent or hoary, decumbent, irregularly

branching shrub; the branches often as thick as a goose-quill. Leaves diphyllous, fleshy; leaflets oblanceolate to obovoid or ellipsoid-obtuse, 4—8 mm long, on a thick fleshy petiole of 5—15 mm. Peduncles 2—5 mm. Sepals rotundate or obovate-elliptical, slightly concave or cucullate above. Petals white with a roundish slightly toothed lamina, with a distinct claw. Staminal scale entire or denticulate. Fruit deeply 5-lobed, obcordate or turbinate-spherical; the lobes occasionally produced and divergent above, usually 5—6 mm in length. — Flow. March to April.

M. ma. Marmarica: sand dunes; from Matruqa to Abukir. — **M. p. N. d. D. l. D. i. D. a. sept. D. a. mer. R.** Everywhere one of the most characteristic plants in deep sandy places.

Local name: khoreysy (Forsk.); hamd (Delile); qillâm; qullâm (Ascherson); batanât; bahsanân (Klunz.); bizz kelbe (Roth); generally: belbel, bawâl; khoreysa; tartîr; qullâm.

Also known from Algeria, Tunisia, Tripolitania and Syria.

838. (6.) **Zygophyllum coccineum** L. Spec. Plant. I (1753), p. 551. — Boiss. Flor. Or. I, p. 915. — DC. Prodr. I, p. 706. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 56 no. 258. — Sickenberg. Contrib. Flor. d'Eg., p. 201. — Zygophyllum desertorum Forsk. Flor. aeg.-arab., p. 87. — Zygophyllum propinquum Decsne in Ann. Scienc. Nat., Ser. 2 Vol. III p. 283. — Decumbent shrub, 50 cm to 1,50 m high, similar in habit to *Z. album*, wholly glabrous; branches ascending or erect. Leaves diphyllous, fleshy; leaflets clavate or cylindric-clavate to subobovoid, usually 4—6 mm long on fleshy petioles of 0,5—1 cm. Peduncles 3—5 mm. Structure of flowers similar to that of *Z. album*; the staminal scales entire or denticulate; the white petals somewhat apiculate. Fruit glabrous, clavate-prismatic, acutely 5-angled; apex retuse, 6—10 mm long. — Flow. March to April.

D. l. D. i. D. a. sept. D. a. mer. Common in sandy places, everywhere.

Local name: ghassûl (Ascherson); bizz kelbeh (Roth); bawâl; generally: rotreyt; kemmûn qarâmâny; tartîr; belbel.

Also known from Tropical Africa and Arabia to Syria.

var. **berenicense** (Schweinfurth) Muschler var. nov. — Zygophyllum berenicense Schweinf. (without descr.) — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 56 no. 257. — Capsule 4—6 mm long, cylindrical. — Flow. March.

D. l. D. a. sept. D. a. mer. Between the type in deep sandy places.

Local name: tartîr; belbel.

Only known from Egypt.

Bastard.

838 a. **Zygophyllum Guyotii** Kneucker and Muschler in Allgemeines Bot. Zeitschrift (1904), p. 162 (837 \times 838. — *Zygophyllum album* \times *Zygophyllum coccineum*). — Young branches and leaves appressed hairy; flowers shortly petioled; capsules with 3—4 mm long, peduncles, cylindrical, sparingly hairy. — Flow. March to April.

D. a. sept. Wady Dugla; Wady Gerrâwy; Wady Rishêd; Suez, in deep sandy places.

Also known from Sinai (cf. Muschler: Beitrag z. Kenntnis der Flora von el-Tor in Verhandlg. Bot. Ver. Prov. Brandenbg. XLIX, p. 105).

323. (7.) Fagonia Linn.

Sepals 5, imbricated, mucronate, deciduous. Petals 5, clawed, imbricated in the bud. Stamens 10, with naked filaments. Ovary sessile, 5-celled; style awl-shaped, 5-angled; stigma simple. Ovules 2, side by side at the base of the cell, attached by ascending funicles. Fruit pyramidal, 5-angled, separating from the axis into 5 carpels dehiscent along their inner angle; 1-seeded. Seeds flattened, oblong with mucilaginous testa. — Perennial, much branched, often prostrate herbs, with opposite leaves, composed of 1—3, mucronate leaflets; stipules generally spiny or prickly; the peduncles inserted between the stipules, solitary, 1-flowered.

A genus of about 30 species in the Desert region.

A. Young branches somewhat 4-angled, with grooved surface.

I. Stipules prickly, small, much shorter than the leaves.

a) Glandulous plants.

1. Greyish-canescant plants.

α) Peduncle deflexed as long as the capsule

1. **F. latifolia.**

β) Peduncle erect; shorter than the capsule

2. **F. glutinosa.**

2. Green plant

3. **F. cahirina.**

b) Eglandular plant

4. **F. cretica.**

II. Stipules spiny, as long as or longer than the leaves.

a) Flowers minute.

1. Internodes short; sepals ovate

5. **F. Bruguieri.**

2. Internodes long; sepals lanceolate

6. **F. myriacantha.**

b) Flowers from 1—2 cm broad

7. **F. mollis.**

B. Young branches rather terete, striped.

I. Peduncle as long as the capsule.

a) Sepals oblong-lanceolate, glandulous . . . 8. *F. arabica*.

b) Sepals ovate, glabrous 9. *F. thebaica*.

II. Peduncles twice as long as the capsule . . 10. *F. parviflora*.

839. (1.) **Fagonia latifolia** Del. Illustr. Flor. d'Eg. (1813), p. 86 tab. 28 fig. 3. — Boiss. Flor. Or. I, p. 904. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 56 no. 245. — Sickenberg. Contrib. Flor. d'Eg., p. 200. — Aschers. Flor. Rhinocol., p. 793 no. 65. — Glandulous; stems erect dichotomously branched; branches thin; internodes elongate; prickles submembranous as long as or shorter than the leaves; the lowest leaves unifoliate, the other ones trifoliate, shortly petiolate; middle leaflet cuncate from the base, ovate-orbiculate, the lateral one oblong, 3—4 times smaller; sepals hairy, ovate-oblong; petals pale rose-coloured, twice as long as the calyx; peduncle deflexed as long as the hairy capsule; seeds acute. — Flow. March to April.

D. a. sept. Gebel ahmar near Cairo; Wady Dugla; Wady Rished near Helwân.

Local name: 'aqûl.

Only known from Egypt.

840. (2.) **Fagonia glutinosa** Del. Illustr. Flor. d'Eg. (1813), p. 86 tab. 26 fig. 3. — Boiss. Flor. Or. I, p. 904. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 56 no. 246. — Sickenberg. Contrib. Flor. d'Eg., p. 200. — Aschers. Flor. Rhinocol., p. 793 no. 65. — *Fagonia viscosa* Hochst. in Schimp. Plant. arab. exsicc. — *Fagonia viscida* Presl Bemerk., p. 30. — A perennial herb, 30—40 cm high, sometimes somewhat more, canescent with viscid, sessile glands, which are often covered with adherent sand, prostrate; internodes long. Petiole shorter than the obtuse or somewhat tapering ovate-rhomboid to obovate or oblong, 5—8 mm long leaflets. Sepals ovate oblong, half as long as the pale-pink corolla. — Flow. December to April.

M. p. El-'Arish; Bîr Abû-Ballah. — **D. i.** Gebel Ekhhên; Bîr-el-Qarsâdah; Sâlihiya; Ismailia. — **D. a. sept.** Everywhere in sandy places, among stones.

Local name: shikâ'a; medahîn.

Also known from Algeria, Tunisia, Tripolitania, Egypt and Palestine.

841. (3.) **Fagonia cahirina** Boiss. Diagnos. Plant. Orient., Ser. I fasc. VIII (1849) p. 122. — Flor. Or. I, p. 905. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 56 no. 248. — Sickenberg. Contrib. Flor. d'Eg., p. 200. — *Fagonia cretica* Del. Illustr. Flor. d'Eg., p. 87 not Linn. — *Fagonia glutinosa* Schimp. plant. exsicc. not L. — *Fagonia sinaica*

Batt. and Trab. Flor. Alg. I, p. 178. — *Fagonia tristis* Sickenbg. Contrib. Fl. d'Eg., p. 200. — A perennial herb, 20—30 cm high, somewhat glandular, green; branches dichotonous, crowded, spreading. Upper leaves often of 1-leaflet, the others of 3, ovate-oblong to oblong, rather obtuse, about as long as the petiole, the terminal one usually longer. Sepals glandular, hairy, ovate; petals pink, 3—5-times as long as the calyx. — Flow. March to April.

D. l. D. a. sept. A common procumbent herb on stony ground as well as in deep sandy places.

Local name: halâwy; ssletêni.

Also known from Algeria, Tunisia, Tripolitania and Syria.

842. (4.) **Fagonia cretica** L. Spéc. Plant. I (1753), p. 553. — Boiss. Flor. Or. I, p. 905. — Lam. Illustr., tab. 346. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 56 no. 247. — Sickenberg. Contrib. Flor. d'Eg., p. 200. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 600 no. 64. — A perennial herb, 20—30 cm high, prostrate, intricately branched, green. Leaves all of 3, linear-lanceolate, acute leaflets, the lateral as long as the petiole, the middle one longer. Sepals papillary; oblong; petals purple, thrice as long as the calyx. — Flow. March to April.

M. ma. Marmarica: Bir-el-qaçaba; Omm Rakum; Matruqa; Ras-el-Kenaïs; Abusîr; Mariut; Alexandria-West and -East; Mandara; Abusîr. — **D. l.** Es-Sabrigât; Kafr Dawûd; Beni Selâma; Kafr Hakîm; Abu Roash; Pyramids of Gîza.

Local name: ssletêni; halâwy.

Also known from Morocco, Algeria, Tunisia, Tripolitania, Southern Spain, Arabia Petraea and Syria.

843. (5.) **Fagonia Bruguieri** DC. Prodrôm. I (1824), p. 704. — Boiss. Flor. Or. I, p. 905. — Aschers.-Schweinf. Illustr., p. 56 no. 249. — Sickenberg. Contrib. Flor. d'Eg., p. 200. — A perennial herb, 20—30 cm high, sometimes somewhat more, pale green, minutely glandular; branches crowded, procumbent, short; internodes short. Spines a little longer than the leaves; leaves short-petioled, the lower with 3, the upper with 1, ovate-oblong, fleshy, mucronate leaflets. Sepals puberulent, ovate; petals pale pink, twice as long as the calyx. — Flow. March to April.

D. l. D. a. sept. D. a. mer. Often abundant in deep sandy places.

Local name: 'aqûl; attâny (Schweinfurth); kushayt.

Also known from the Algerian deserts, Arabia Petraea, Syria, Mesopotamia and Persia.

844. (6.) **Fagonia myriacantha** Boiss. Diagnos. Plant. Orient., Ser. I fasc. VIII (1849) p. 123. — Flor. Or. I, p. 906. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 752. — Boiss. Flor. Orient., Supplem. p. 146. — Fagonia Schimper Prsl. Bot. Bemerk., p. 30. — A perennial herb, 10—20 cm high, sometimes somewhat more, sparingly glandular, pale green; branches numerous, prostrate; internodes long. Spines spreading, sharp, much longer than leaves, sometimes 3 cm long; leaves nearly sessile, the lower with 3, the upper with 1, oblong-linear to linear, minute leaflets. Sepals rather glabrous, lanceolate, long-acuminate; petals pale flesh-coloured, twice to twice and a half as long as the calyx. — Flow. March to April.

D. a. sept. Wady Om-Dhamrana (Schweinfurth).

Also known from Syria and Palestine.

845. (7.) **Fagonia mollis** Del. Illustr. Flor. d'Eg. (1813), p. 86 tab. 28 fig. 2. — Boiss. Flor. Or. I, p. 907. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 56 no. 250. — Sickenberg. Contrib. Flor. d'Eg., p. 201. — Fagonia cistoides Del. in Bov. plant. exsicc. — A perennial herb, 15—30 cm high, hispid, yellowish-glandular; branches erect; internodes generally short. Spines hispid, longer than the petiole, often as long as the leaves; leaves crowded, with 3, large, fleshy, ovate, obtuse, mucronate leaflets of nearly equal size, much longer than the petiole. Sepals ovate, hairy; petals pink, 1 cm long, nearly thrice as long as the calyx. — Flow. March to April.

D. a. sept. Gebel ahmar near Cairo; Wady Turra; Wady Hof near Helwan; Suez. — **D. a. mer.** Qoseyr; Wady Etit; Gebel Ferrâye.

Local name: 'aqûl.

Also known from Sinai.

846. (8.) **Fagonia arabica** L. Spec. Plant. I (1753), p. 533. — Boiss. Flor. Or. I, p. 907. — Aschers. Flor. Rhinocol., p. 793 no. 66. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 56 no. 251. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 752. — Sickenberg. Contrib. Flor. d'Eg., p. 200. — A perennial herb, 30—40 cm high or sometimes somewhat more, sparingly glandular; branches erect. Spines longer than the leaves, often as long as or longer than the internodes; petiole as long or longer than the linear, acute leaflets. Sepals oblong-lanceolate, glandular; petals pale pink, twice as long as the calyx. — Flow. February to March.

M. p. El-'Arish: Sath. — **O.** Little Oasis; Dakhel; Great Oasis. — **D. l. D. i. D. a. sept. D. a. mer.** A common plant on calcareous-ground and under stones.

Local name: mar'a-el-gêmâl (Ascherson); shibriq (Ascherson); gemdâh (Forsk.); hâd; 'aqûl-el-ghazâl (Ascherson); shueyka; shokân (Schweinfurth).

Also known from Tripolitania, Syria and Palestine.

847. (9.) **Fagonia thebaica** Boiss. *Diagnos. Plant. Orient.*, Ser. I fasc. VIII (1849) p. 121. — *Flor. Or. I*, p. 907. — Aschers.-Schweinf. *Ill. Flor. d'Eg.*, p. 56 no. 251. — Sickenberg. *Contrib. Flor. d'Eg.*, p. 200. — A perennial plant, 20—30 cm high, sometimes somewhat more, glabrous, green, shrubby, with erect branches; the lower prickles very short, the upper one elongate as long as the leaves; leaves fleshy, the lower-ones trifoliate the upper ones unifoliate; petiole terete; leaves oblong-cylindrical obtuse, mucronate; sepals ovate-oblong, petals rose-coloured twice as long as the sepals; peduncle recurved as long as the hairy, depressed capsule or somewhat longer. — Flow. March to April.

D. l. Thebes; Esne, in deep sand of the desert.

Only known from this locality.

848. (10.) **Fagonia parviflora** Boiss. *Diagnos. Plant. Orient.*, Ser. I fasc. VIII (1849) p. 124. — *Flor. Or. I*, p. 908. — Aschers.-Schweinf. *Ill. Flor. d'Eg.*, p. 56 no. 253. — Sickenberg. *Contrib. Flor. d'Eg.*, p. 200. — Young stems and branches glandular-hairy, at length glabrous, branched from the neck; branches ascendent or erect; internodes long; spines small, unequal, often as long as or sometimes longer than the leaves; all the leaves 1-foliate; petiole short; leaflet plane linear-lanceolate, shortly and oblique mucronate; sepals papillous shortly lanceolate; petals pale rose-coloured twice as long as the calyx; peduncle deflexed, twice as long as the hairy capsule. — Flow. March to April.

N. v. Cataractes near Aswân. — **D. l.** Between Gebel Gara' and Bibân-el-Melûk. — **D. a. mer.** Kene; Qoseyr.

Also known from Nubia (?).

52. Rutaceae.

Flowers regular and hermaphrodite, or very rarely unisexual. Calyx usually small, 4 or 5-lobed, or divided into as many distinct imbricate sepals, rarely large, or with fewer or more numerous or valvate lobes. Petals of the same number as sepals, free or rarely cohering, hypogynous or slightly perigynous, imbricate or valvate in the bud. Stamens usually free, either equal in number to the petals and alternate with them, or double the number, or rarely more numerous, when twice as many as petals the sepaline ones

(those opposite the sepals) usually longer than the others. Anthers usually versatile, with 2 parallel cells opening longitudinally, the connective occasionally tipped by a gland or projecting appendage. Torus usually more or less thickened into an entire crenate or lobed disk, within the stamens, under or round the ovary. Gynoecium of 4 or 5, rarely more or fewer carpels, more or less united into a single lobed or entire ovary, or rarely quite distinct, with one cell to each carpel. Styles as many as carpels, either free at the base but united upwards, or united from the base; stigma terminal, entire or lobed. Ovules usually 2 in each cell, superposed or rarely collateral or solitary, or more than 2; the micropyle superior. Fruit separating into 2-valved or rarely indehiscent cocci, or the carpels united in an indehiscent berry or drupe, or rarely in a loculicidally dehiscent capsule, the endocarp frequently separating from the pericarp. Seeds usually solitary in each cell; testa crustaceous and often shining, or rarely coriaceous or membranaceous; albumen fleshy or none. Embryo straight or curved, large in proportion to the seed; cotyledons flat or rarely folded; radicle superior. — Trees or shrubs, very rarely herbs, marked with glandular pellucid dots on the leaves and other thin herbaceous parts. Indumentum usually stellate, if any. Leaves opposite or alternate, simple or compound, entire or rarely toothed or lobed. Stipules none. Flowers axillary or terminal, solitary, clustered, cymose, or paniculate, very rarely racemose and seldom if ever spicate.

A large Order, ranging over the hotter and temperate regions of the whole World, but chiefly abundant within the Tropics, in South Africa and in Australia.

A. Petals in most flowers 4; stamens 8 1. *Ruta*.

B. Petals 5; stamens 10 2. *Haplophyllum*.

324. (1.) *Ruta* Linn.

Terminal flowers 5-merous. Calyx of all the lateral flowers 4-parted. Petals 4, hooded, dentate or fringed, rarely entire. Stamens 8. Ovary sessile, 4-lobed; cells 6—8-ovuled. Cells of the capsule splitting inwardly at the apex. — Strong-scented herbs with an indurated base, pinnate leaves, corymbose inflorescence, and bracted, yellow flowers.

A small genus in Europe in the Mediterranean region.

849. *Ruta chalepensis* L. Mant. I (1764), p. 69. — Boiss. Flor. Or. I, p. 922. — Halasc. Consp. Flor. Graec. I, p. 311. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 57 no. 263. — *Ruta angustifolia* Pers. Syn. I, p. 464. — Rehbch. Ic. V, fig. 4813. — A perennial herb,

50—60 cm high, or sometimes more. Leaves oblong in outline, bipinnatifid into oblanceolate or obovate leaflets. Bracts lanceolate; calyx-lobes triangular, acute; petals deeply fringed, abruptly clawed; capsules acutely lobed. — Flow. March to April.

M. ma. M. p. N. d. N. f. N. v. O. D. l. D. i. D. a. sept. D. a. mer. Cultivated everywhere in gardens and often spontaneous.

Local name: harmal (G. Roth); sendeb; sêdeb; sadhâb (Muschler).

Also known from all the other parts of the Mediterranean region.

325. (2.) **Haplophyllum** Adr. Juss.

Calyx 5-parted. Petals 5, hooded, entire. Stamens 10, the filaments dilated at the base, free or somewhat monadelphous. Ovary 5-lobed, depressed. Ovules 2 in each cell (in ours) side by side, or 4. Stigma capitate. Capsule glandular, 5-celled, splitting inwardly at the apex, rarely indehiscent. Seeds transversely wrinkled, tubercled. — Herbs, usually with a woody root and trunk, erect or divaricate stems, simple or 3-parted leaves, and corymbose, bracted inflorescence.

A small genus, widely distributed in the Mediterranean region.

850. **Haplophyllum tuberculatum** (Forsk.) Adr. Juss. in Mém. Mus. XII (1825), p. 464 tab. 17 no. 10. — Boiss. Flor. Or. I. p. 939. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 57 no. 264. — Aschers. Flor. Rhinocol., p. 793 no. 70. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 600 no. 69. — Jaub. and Spach Illustr. Plant. Orient. III, tab. 269. — Deless. Ic. III, tab. 43. — *Ruta tuberculata* Forsk. Flor. aeg.-arab., p. 86. — A perennial herb, 30—40 cm high, crisp-pubescent or glabrescent; stems ascending, much forked. Lower leaves and those of sterile branches obovate or oblong-spathulate, tapering into a petiole, the upper one spathulate-linear, obtuse, all from 5—12 mm long, more or less crenate, wavy-margined. Flowers scattered, subsessile, in forked cymes; calyx glabrous; petals somewhat clawed, oblong, obtuse. — Flow. October to March.

M. ma. M. p. N. d. N. v. O. D. l. D. i. D. a. sept. D. a. mer. A common herb in the sandy deserts. — The plant has a very disagreeable smell.

Local name: mugennine (Forsk.); gergîg (Delile); derrâta (Ehrenberg); megennine (Ascherson); generally: shegeret-er-rîh; rîbeh.

Also known from Morocco, Algeria, Tunisia, Nubia, Arabia Petraea, Palestine and Persia.

53. Simarubaceae.

Flowers regular, dioecious or polygamous, more rarely hermaphrodite. Calyx usually small, 3—5-lobed, or divided into as many distinct sepals. Petals 3—5, hypogynous or slightly perigynous, imbricate or valvate in the bud, rarely wanting. Stamens either equal in number to the petals, and alternating with them, or double the number; anthers usually versatile, with 2 parallel cells opening longitudinally. Disk annular, cupular, or elongated with the stamens, under or round the ovary, or rarely none. Gynoecium of 3—5, rarely more or fewer carpels, quite distinct, or more or less united into a single-lobed or rarely entire ovary, with one cell to each carpel. Styles as many as carpels, united from the base or by the stigmas only, or entirely distinct. Ovules solitary in each cell, or very rarely 2, the micropyle superior. Fruit-carpels either distinct, dry or drupaceous, usually indehiscent, or united in a single drupe or capsule. Seeds usually solitary in each carpel or cell, pendulous; testa membranous; albumen abundant, or little, or none. Embryo straight or curved; cotyledons flat or convex, rarely twisted; radicle superior. — Shrubs or trees, with a bitter bark. Indumentum of simple not stellate hairs. Leaves alternate or rarely opposite, pinnate or simple, usually without glandular dots. Stipules none, except in *Cadellia*. Flowers usually small, in axillary or rarely terminal panicles or racemes.

The Order consists of a considerable number of small genera, chiefly tropical, dispersed over the New as well as the Old World. The Order as a whole is somewhat heterogeneous, and especially has no peculiar habit. In technical characters it is closely allied to Rutaceae, from which it differs chiefly in the bitter bark, the want of pellucid dots to the leaves, and in the solitary ovules but each of these characters has some exceptions.

326. *Balanites* Delile.

Flowers hermaphrodite. Sepals 5, with imbricate margins, deciduous. Petals as many. Stamens 10; filaments unappendaged; anthers dorsally affixed. Ovary globose, pilose, 5-celled, inserted upon a thick fleshy disk; style simple, terminal. Ovules solitary. Fruit a drupe, 1-seeded, with a bony or crustaceous putamen. Seed "exalbuminous; embryo with thick plano-convex, corrugate or 2-lobed cotyledons and a superior radicle". — Shrubs or small trees, usually armed, at least when young or stunted, with axillary or supra-axillary spines. Leaves 2-foliolate; leaflets entire, coriaceous. Flowers greenish, in axillary fascicles or short racemose cymes.

A genus of two or three species, confined to the warmer parts of Africa and Asia.

851. **Balanites aegyptiaca** Delile Illustr. Flor. d'Eg. (1813), p. 263 tab. 28 fig. 1. — Boiss. Flor. Or. I, p. 944. — DC. Prodrum. I, p. 708. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 58 no. 265. — Sickenberg. Contrib. Flor. d'Eg., p. 208. — *Ximenia aegyptiaca* L. Spec. Plant. I, p. 1194. — Extremities terete, minutely hoary-puberulous or glabrate; spines various, usually about 1—2 cm. sometimes 6 cm, often wanting on fully grown trees, straight, ascending or patent. Leaflets elliptical or varying from ovate- to obovate-elliptical or rotundate, obtuse or broadly pointed, 1—2½ cm long, shortly petiolulate: petiole usually much shorter than the leaflets. Ovary soon lengthening out after flowering, narrowed into the style. Drupe edible, with a thick bony putamen; the seed affording an oil. — Flow. March to April.

O. Little Oasis; Great Oasis. — **D. a. mer.** Wady Kene near Kene; Qoseyr; Wady Gemâl; Wady Gadire.

Local name: balah harrâre (G. Roth); iglig; liglig (Ascherson, Schweinfurth); generally: hegelig.

Also known from Tropical Africa.

54. Meliaceae.

Flowers regular, usually hermaphrodite. Calyx small, 4 or 5-lobed, or divided into as many distinct sepals. Petals 4 or 5, rarely more, or 3 only, free or adnate to the staminal tube, imbricate or rarely valvate. Stamens as many, or more frequently twice as many, as petals; the filaments, in Meliaceae proper, united in a tube; anthers sessile or shortly stipitate, within or at the summit of the tube; in Cedreleae, filaments free. Disk various, often annular or tubular, free within the staminal tube. Ovary free, entire, 3 to 5-celled; style simple; stigma thick, disk-shaped or pyramidal. Ovules in each cell 2 or 4 or more, the micropyle superior. Fruit a capsule, berry, or rarely a drupe, indehiscent, or septicidally or loculicidally dehiscent. Seeds 1, rarely 2, or in Cedreleae few in each cell, with a ventral hilum; albumen fleshy or none, embryo flat or nearly so, radicle superior. — Trees or shrubs, the wood often coloured and sometimes fragrant, the bark rarely bitter. Leaves alternate or very rarely opposite, simple, or more frequently pinnate, the petiole often continuing long to grow out and produce fresh leaflets; leaflets without dots, except in Flindersia. Flowers paniculate, often small.

The Order is found abundantly in the tropical or warm regions of Asia and America, more rarely in Africa.

327. *Melia* Linn.

Calyx 5—(6-)partite; lobes imbricate. Petals as many as calyx-lobes, spreading, contorted in aestivation. Stamens 10—12, monadelphous. Anthers included within the slightly dilated 10—12-fid mouth of the cylindrical tube. Ovary 3—6-celled; style slender; stigma capitate. Ovules 2 in each cell, superposed. Fruit drupaceous, with a 1—5-celled bony putamen. — Trees. Leaves alternate, 2 to 3-pinnate (or simply pinnate). Panicles ample, axillary usually collected towards the ends of the branches.

A small genus of India, the Archipelago, and Australia, one species (the following) widely dispersed by cultivation in warm countries.

850. *Melia Azedarach* L. Spec. Plant. I (1753), p. 550. — Boiss. Flor. Or. I, p. 954. — Cavan. Diss. VII, p. 363 tab. 207. — DC. Prodrum. I, p. 621. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 58 no. 266 a. — *Media angustifolia* Schum. and Thom. Guin. Plant., p. 214. — Leaves 30—60 cm high. 2-pinnate; leaflets lanceolate or varying from ovate-lanceolate to elliptical, acute or acuminate, serrate incise-serrate or subentire. Fruit with a 5-celled putamen or, by abortion, with fewer cells. — Flow. February to March.

M. ma. *N. d.* *N. f.* *N. v.* Cultivated everywhere in gardens often semi-naturalized.

Local name: zenzulakht.

Also known from Greece, Syria, Anatolia, Tropical Africa and Persia.

55. Polygalaceae.

Flowers hermaphrodite, irregular. Sepals 5, free, much imbricate, the 2 inner ones usually larger and petal-like. Petals 3 or 5, rarely all free, most frequently 2 or 4 in pairs united at the base with the lower concave or helmet-shaped petal or keel and often with the staminal tube. Stamens 8, rarely 5 or 4, usually united to above the middle in a sheath open on the upper side. Anthers erect, 1 or 2-celled, usually opening by a single terminal or oblique pore. Torus small, or rarely expanded into a disk within the stamens. Ovary free, 2-celled or rarely 1-celled, or in a few flowers 3—5-celled. Style simple, usually curved at the top, with a variously shaped entire or 2-lobed stigma. Ovules usually solitary in each cell, pendulous, anatropous with a ventral raphe. Seeds pendulous, the crustaceous testa often hairy, and bearing a caruncle at the hilum or at the opposite end. Albumen fleshy or rarely deficient. Embryo straight, with flat, convex, or rarely thick and fleshy cotyledons. — Herbs, undershrubs, or small shrubs, rarely tall shrubs, climbers or trees, glabrous or hairy, but without stellate hairs. Leaves usually alternate

and entire, without stipules, very rarely opposite. Flowers solitary or in spikes or racemes, rarely paniculate, the pedicels usually articulate at the base, with a subtending bract and 2 bracteoles.

A considerable Order, widely dispersed over nearly the whole globe.

328. *Polygala* Linn.

Sepals unequal, the 2 innermost, or wings, large and petal-like. Petals 3, united in a single corolla open on the upper side, the keel bearing a crest-like appendage on the back near the top, or rarely 3-lobed. Stamens 8, united to above the middle in a sheath open on the upper side, and adnate to the petals at the base. Ovary 2-celled. Style various. Capsule thin or rarely coriaceous, flattened, obovate, ovate, or orbicular, usually notched at the top, opening loculicidally at the edges. Seeds ovate or oblong, hairy or glabrous, but the hairs not lengthened into a coma, with or without a caruncle at the hilum. — Herbs, undershrubs, or shrubs. Leaves usually alternate or whorled. Racemes or spikes terminal or lateral, rarely axillary.

A very large genus, abundant in tropical countries, and generally also in temperate regions, except in Australia, where it is, with one exception, limited to the tropical districts.

853. *Polygala erioptera* DC. Prodom. I (1824), p. 326. — Boiss. Flor. Or. I, p. 469. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 45 no. 131. — Sickenberg. Contrib. Flor. d'Eg., p. 182. — *Polygala obtusata* DC. Prodom. I, p. 326. — *Polygala arabica* Edgew. Journ. Soc. Asiat. XVI, p. 1216 not Boiss. — *Polygala Vahlia* DC. Prodom. I, p. 326. — Deless. Ic. III, tab. 15. — *Polygala oligantha* Rich. Flor. Abyss. I, p. 38. — *Polygala linearis* R. Br. in Salt Abyss., p. 65. — An erect, diffuse or decumbent, often much-branched, pubescent or puberulous annual, the erect form attaining 30 or 60 cm. Leaves narrow-linear to linear-oblong, more or less pointed obtuse or even retuse in the broad-leaved forms, pubescent strigillose or glabrate, usually 1—2 cm long, 1—4 mm broad, sometimes shorter and narrower. Flowers in extra-axillary or axillary, few-flowered fascicles heads or racemes, much shorter than the leaves, sometimes solitary. Bracts persistent. Wing-sepals oval or obliquely elliptical, pubescent, with a principal median often broadly herbaceous nerve, and faint looping and divergent lateral ones. Lateral petals obovate to ovate. Capsule ovate-elliptical to obovate, emarginate, pubescent, scarcely winged, shorter than the wing-sepals. — Flow. February to March.

N. v. Korrör-esh-shellâl; Aşwân. — **D. i.** Desert-el-Tih.

A widely distributed species in Tropical Africa, extending to India, where it appears to be common.

56. Euphorbiaceae.

Flowers monoecious or dioecious, usually regular. Perianth occasionally absent in one or both sexes, usually small, often dissimilar in the two sexes, simple, valvate or imbricate, calycine, rarely petaloid, or double, both outer and inner calycine and imbricate, or the inner petaloid, imbricate, rarely subvalvate, longer or shorter than the outer. Male: stamens definite or indefinite ($1-\infty$); filaments free or connate; anthers 2- (rarely 3-4-) celled; cells usually parallel, adnate to the connective throughout or free except at base or apex and erect, divaricate or suspended, rarely superposed; dehiscence usually longitudinal, rarely porous. Rudimentary ovary present or absent. Female: ovary sessile, rarely shortly stipitate, usually 3-, frequently 2- or 4-, very rarely 1- or more than 4-celled; styles usually as many as and continuous with the carpels, free or more or less connate, erect or spreading, entire or 2-fid or laciniate; inner face of styles or style-arms usually stigmatic throughout; ovules in each cell solitary or 2 collateral, pendulous from the inner angle; funicle often thickened. Disk annular, entire or lobed, or of free contiguous or discrete scales, or none. Fruit usually capsular of 2-valved cocci separating from a persistent axis, or indehiscent and drupaceous, 1-3-celled or of a single or 2-3 connate nuts. Seeds attached laterally near or above the middle of the cell, with or without a caruncle or an arillus; albumen usually copious, fleshy; embryo straight, radicle superior, cotyledons broad, flat, rarely thick, fleshy. — Herbs, shrubs or trees, often with milky juice. Leaves alternate or opposite, simple or rarely compound, sometimes rudimentary; stipulate or exstipulate. Flowers usually small or very small; inflorescence rather variable.

Species about 4000, mostly in the tropics of both hemispheres.

A. Flowers with a calyx, without an involucre.

I. Seeds and ovules 1 in each cell.

a) Flowers in terminal racemes or spikes.

1. Anthers inflexed in the bud 1. *Croton*.
2. Anthers erect in the bud 2. *Crozophora*.

b) Flowers in axillary or terminal spikes; stamens 8 or more; anthers erect in the bud.

1. Sepals 3 or calyx 3-parted. Stamens 8-20; anther-cells attached at the tip, pendulous. Ovary 2-lobed. Styles (slightly united at the base) strongly papillose, undivided; leaves undivided 3. *Mercurialis*.
2. Calyx 3-5-parted. Stamens very numerous; the filaments repeatedly branched. Leaves

- palmately cut. Styles 2-parted; ovary
 3-lobed 4. *Ricinus*.
- II. Seeds and ovules 2 in each cell; flowers
 monoecious.
- a) Flowers axillary. Stamens 3, united. . . . 5. *Phyllanthus*.
 b) Flowers axillary, the staminate petaliferous.
 Stamens 5 or 6 6. *Andrachne*.
- B. Flowers all without a calyx, included in a cup-shaped
 calyx-like involucre, — the whole liable to be
 mistaken for a single flower. Involucre surrounding
 many staminate flowers (each of a naked stamen)
 and one pistillate flower (a 3-lobed pistill) 7. *Euphorbia*.

329. (1.) *Croton*.

Flowers monoecious or rarely dioecious in terminal racemes. Male flower: Calyx of 5, rarely 4 or 6 segments, imbricate or almost or quite valvate in the bud. Petals as many and usually as long as the calyx-segments. Glands small, alternating with the petals. Stamens indefinite (5 to above 30), inserted on a rather broad, usually hairy receptacle or disk; filaments free, inflected in the bud below the anther, erect and usually exceeding the expanded flower; anthers adnate to a connective continuous with the filaments, with 2 parallel cells opening longitudinally. Female flower: Calyx-segments usually narrower than in the males and sometimes enlarged. Ovary 3-celled (very rarely 2 or 4-celled), with 1 ovule in each cell. Styles divided into 2 or 4 branches. Capsule separating into 3 deciduous 2-valved cocci. Seeds smooth, with a small caruncle; testa crustaceous or hard. Albumen copious; cotyledons broad. — Trees, shrubs, or rarely herbs, usually clothed or sprinkled with stellate hairs or scales, rarely quite glabrous. Leaves alternate or very rarely opposite, sometimes almost verticillate immediately under the inflorescence, petiolate, entire variously toothed or very rarely lobed, penniveined or rarely 3 or more nerved at the base, with 2 or more small sessile or stipitate glands at the top of the petiole or base of the lamina. Stipules usually minute. Flowers usually clustered along the rhachis of a terminal raceme, the bracts very small.

The genus is a very large one, extending over the tropical regions of both the New and the Old World.

854. *Croton glandulosus* L. Spec. Plant. I (1753), p. 371. — Annual, rough with bristly hairs; stem umbellately branched; leaves oblong, obtuse, coarsely serrate, mostly crowded at the divisions

of the stem and summit of the branches; the slender petiole biglandular at the apex; racemes small; male flowers minute, white; calyx 4-parted; petals 4; female flowers few, with the calyx 5-parted. — Flow. March.

M. ma. Ramle, in cotton-fields.

Introduced from America with cotton.

330. (2.) **Crozophora** Neck.

Flowers monoecious. Calyx 5-parted, valvular in the bud. Disk glandular, 5-lobed. Male flowers: petals 5, alternate with the sepals. Stamens 5—15, in 1—3 whorls, the filaments coalesced in a central column, the anthers 2-celled, with an excurrent, mucronate connective. Female flowers: petals 5, narrow, sometimes 0; staminodes 5 or 0; ovary globular, 3-celled, cells 1-ovuled; styles 3, 2-fid or parted, stigmatose on one side; capsule ovate-glabular, consisting of 3, 1-seeded, 2-valved cells; seeds tapering at the tip, triquetrous, without a camucle; embryo central in on oleaginous albumen; cotyledons broad, radicle short. — Herbs or shrubs with stellate or scurfy hair, and alternate, stipuled leaves.

A large genus widely distributed in the temperate and tropic region of both the Old and New World.

A. Leaves long-petiolate.

I. Leaves ovate; petals lanceolate-ovate 1. **C. plicata**.

II. Leaves ovate-rhombic; petals linear 2. **C. tinctoria**.

B. Leaves shortly petiolate 3. **C. obliqua**.

855. (1.) **Crozophora plicata** (Vahl) A. Juss. Tent. Euph. (1824), p. 28. — *Croton plicatum* Vahl Symb. Bot. I, p. 75. — Boiss. Flor. Or. IV, p. 1140. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 138 no. 973. — Sickenberg. Contrib. Flor. d'Eg., p. 276. — *Crozophora prostrata* Dalz. Bomb. Flora p. 233. — *Croton Rottleri* Geiss. *Croton Monogr.*, p. 19. — *Croton obliquifolium* Visian. Plant. Egypt., tab. 7. — An annual plant, densely greyish tomentously hairy; branched from the neck; branches elongate, ascendent or erect, dichotomously branched; leaves long-petioled, oblique subcordate at the base, ovate, obtuse, repand or trilobate; stipules linear; racemes axillary and terminal; the upper male, the lower parts female; male flowers subsessile, spicate, 15—10-androus; petals lanceolate-ovate; female flowers 1—3 on deflexed peduncles; petals sublinear; capsule with stellate hairs tomentose; seeds smooth. — Flow. February to March.

N. d. N. v. Common in fields.

Local name: ghobheyra (Roth); nil (Schweinfurth); qoddah.

Also known from Nubia, Abyssinia, Tropical Arabia to India.

var. **prostrata** (Dalz.) Muell. Arg. in DC. Prodröm. XV, fasc. II (1864), p. 747. — Branches and stems prostrate.

N. d. N. v. With the type everywhere.

Local name: ghobheyrâ; battikh-el-malâika (Forsk.).

Also known from Tropical Africa, Arabia and India.

856. (2.) **Crozophora tinctoria** (L.) Adr. Juss. Tent. Euph. (1824), p. 28 tab. 7 fig. 25. — Boiss. Flor. Or. I, p. 1140. — Rehbch. Ic. V, fig. 4805. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 138 no. 974. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 772. — *Croton tinctoria* L. Spec. Plant. I, p. 1425. — Ic. Flor. graec., tab. 950. — An annual herb; 30—40 cm high, sometimes somewhat more, stellate-woolly, not pannous, grey; stem forked. Leaves long petioled, rounded, subcordate, or short-cuneate at the base, rhombic-ovate, 2—6 cm long, obtuse, repand-serrate and often obscurely 3-lobed. Staminate flowers subdecandrous; sepals linear-lanceolate, petals linear. — Flow. March to April.

N. d. N. v. Like the preceeding species often in fields, and on the sides of irrigation canals.

Local name: ghobbeyrâ.

Also known from all the other parts of the Mediterranean region.

var. **subplicata** Muell. Arg. in DC. Prodröm. XV fasc. II (1864), p. 748. — Boiss. Flor. Or. IV, p. 1141. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 138 no. 974. — Leaves acute, sinuate-lobed. — Flow. March.

N. d. N. v. Like the type on the sides of irrigation canals.

Local name: ghobbeyrâ.

Also known from the other parts of the Mediterranean region.

var. **hierosolymitana** Muell. Arg. in DC. Prodröm. XV fasc. II (1864), p. 728. — Aschers. Flor. Rhinocol., p. 804 no. 286. — Sickenberg. Contrib. Flor. d'Eg., p. 277. — *Croton hierosolymitana* Spreng. Syst. III, p. 580. — Densely pannous, divaricately branched. Leaves long-petioled, rounded or subcordate at the base, ovate to oblong-ovate, obtuse to acutish, repand. Male flowers subpentandrous; sepals and petals linear-lanceolate. — Flow. February to March.

M. p. El-'Arish; Henwah; Qabr 'Amîr; Sheykh Zoyêd. — **O.** Great Oasis.

Local name: faqqûs-el-homâr (Ascherson).

Also known from Southern Spain and the other parts of Northern Africa.

857. (3.) **Crozophora obliqua** (Vahl) Adr. Juss. Tentam. Euph. (1824), p. 28. — Boiss. Flor. Or. IV, p. 1141. — Aschers.-Schweinf. Ill.

Flor. d'Eg., p. 138 no. 975. — *Croton obliquum* Vahl Symbol. Bot. I, p. 78. — *Croton oblongifolium* Del. Illustr. Flor. d'Eg., p. 379 tab. 51 fig. 1. — A shrub of 50 cm to 1 m in height, pannous, woody at the base; branches erect or ascending. Leaves short-petioled or rather sessile, rounded or short-cuneate at the base, ovate to ovate-lanceolate, acutish to acuminate. Male flowers subpentandrous, petals ovate-lanceolate; petals of the female flowers linear. — Flow. January to March.

O. Farâfra; Dakhel; Great Oasis. — **D. a. sept.** **D. a. mer.** On the margin of the desert, in deep sand.

Local name: sammah (Schimper); sabbâgh (Klunzinger); nil (Schweinfurth).

Also known from Tropical Africa.

331. (3.) *Mercurialis* Linn.

Erect herbs, with opposite leaves, and small green flowers in little clusters, either sessile, stalked, or spiked in the axils of the leaves, the males and females distinct, on the same or on separate plants. Perianth of 3 segments. Male flowers with 9—12 stamens. Females with a sessile 2-celled ovary, crowned by 2 simple styles, and surrounded by 2 or 3 small filaments. Capsule 2-celled, otherwise like that of *Spurge*.

A small genus, spread over the temperate regions of the southern as well as the northern hemisphere, and nearly connected with several more tropical genera of weed-like, uninteresting plants.

858. *Mercurialis annua* L. Spec. Plant. I (1753), p. 1465. — Boiss. Flor. Or. I, p. 1142. — Rehbch. Ic. V, tab. 152. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 139 no. 976. — Sickenberg. Contrib. Flor. d'Eg., p. 276. — An erect, glabrous annual, 12—50 cm high, with opposite branches. Leaves stalked, ovate or oblong, rather coarsely toothed, of a thin texture. Male flowers clustered, along slender peduncles nearly as long as the leaves. Females 2 or 3 together, either sessile or shortly stalked, in the axils of the leaves, usually on separate plants from the males. Ovaries larger than the perianth, with rather long, spreading styles. Capsules more or less covered with warts or soft prickles. — Flow. March to April.

M. ma. Abusir; Alexandria-West and -East; Mandara; Abukîr, in deep sandy places, not common. — **N. d.** In cultivated an waste places.

Also known from all the other parts of the Mediterranean region and Middle Europe.

332. (4.) **Ricinus** Linn.

Flowers large, in terminal subpaniculate racemes, monoecious, apetalous, the upper male crowded, lower female. Disk none. Male flower: Calyx membranous, splitting into 3—5 valvate segments. Stamens numerous, filaments crowded, variously connate or in branching clusters; anther-cells distinct, distant, subglobose, divergent. Pistillode none. Female flower; Calyx spathaceous, caducous. Ovary 3-celled; styles purple, short or long, spreading, often very large, entire, 2-fid or 2-partite, feathery or papillose; cells 1-ovulate. Capsule of 3 2-valved cocci. Seeds oblong, testa crustaceous, albumen fleshy; cotyledons broad, flat. — Tall glabrous subarborescent shrubs.

Species generally tropical.

859. **Ricinus communis** L. Spec. Plant. I (1753), p. 1430. — Boiss. Flor. Or. IV, p. 1143. — Sibth. and Smith For. graec., tab. 752. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 139 no. 977. — Rehbch. Ic. V, fig. 4801. — Sickenberg. Contrib. Flor. d'Eg., p. 277. — An evergreen, usually large shrub, the young growth often glaucous. Leaves green or reddish, 16—44 cm in diameter, membranous, palmately lobed, the lobes often long and linear and glandularly serrate; petioles 8—22 cm or more long. Racemes stout, erect. Male flowers 1 cm diameter; female calyx nearly as long; styles often highly coloured. Capsule 1—2 cm long, globosely oblong, smooth or echinate. Seeds oblong smooth, mottled. — Flow. January to February.

M. ma. M. p. N. d. N. f. N. v. O. Cultivated everywhere or obtaining from the seeds the Cast or oil and naturalized abundantly.

Local name: kharwa'.

Supposed to belong to Africa, but now naturalized in most hot countries.

333. (5.) **Phyllanthus** Linn.

Flowers small, monoecious, usually in axillary clusters, apetalous. Disk various, rarely none. Male flowers: Sepals 4—6, imbricate in 2 series. Disk glands various. Stamens 3—5 in the centre of the flowers, filaments free or connate; anthers 2-celled, oblong or didymous, rarely reniform, cells parallel or diverging, slits extrorse vertical or transverse by the confluence of the cells. Pistillode none. Female flowers: Sepals of the male. Ovary 3 or more celled. Styles free or connate, usually 2-fid with slender branches, rarely dilated; ovules 2 in each cell. Fruit of 3 or more crustaceous or coriaceous rarely bony 2-valved cocci, with or without a separable

coriaceous rarely fleshy epicarp. Seeds 3-gonous, estrophiolate, testa crustaceous, albumen fleshy; cotyledons flat or flexuous. Herbs, trees or shrubs. Leaves distichous, alternate, quite entire.

Species in all warm countries.

860. **Phyllanthus rotundifolius** Willd. Spec. Plant. IV (1805). p. 584. — Boiss. Flor. Or. IV, p. 1139. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 138 no. 972. — An annual erect herb; monoecious, glabrous, branching from the base; branches compressed-angulate; flowers shortly pedicellate, lobes of the calyx obovate with hyaline margins; stamens connate to a column; capsule smooth; seeds longitudinally costate. — Flow. February to March.

M. ma. Alexandria-West. — **N. d.** Cairo. — **N. v.** Suez, margins of the fresh water canal.

Also known from tropical Africa and India.

334. (6.) **Andrachne** Linn.

Flowers monoecious, in axillary clusters or the females solitary. Male flowers: Calyx more or less deeply divided into 5 or 6 lobes or segments. Petals as many as calyx-lobes and shorter than them. Glands as many as petals and opposite to them. Stamens as many as petals and alternate with them; anther-cells distinct, parallel, opening longitudinally in 2 valves. Rudimentary ovary in the centre very small. Female flowers: Calyx usually larger than in the males. Petals minute or none. Ovary 3-celled, with 2 ovules in each cell. Styles 3, more or less deeply divided into 2 entire branches. Capsule separating into 3 2-valved cocci. Seeds curved, 3-angular, rugose, not carunculate. Embryo curved, with broad cotyledons. — Herbs or undershrubs, with procumbent ascending or erect branching stems. Leaves alternate, petiolate, entire, usually small. Flowers very small, pedicellate in the axils, the females solitary, with or without a few males in the same axil.

The genus contains but few species, dispersed over the temperate and subtropical regions of both the New and the Old Worlds.

- A. Glabrous; leaves obovate 1. **A. telephioides**.
 B. Papillose-scabrous or hirtellous; leaves reniform . 2. **A. aspera**.

861. (1.) **Andrachne telephioides** L. Spec. Plant. I (1753), p. 1439. — Boiss. Flor. Or. IV, p. 1138. — Rehbch. Ic. V, fig. 4807. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 770 no. 1319. — Sickenberg. Contrib. Flor. d'Eg., p. 278. — Aschers. Flor. Rhinocol. p. 804 no. 235. — A perennial herb, 10—40 cm high, glabrous, glaucous; stems filiform, simple or branching, leafy. Leaves petioled,

obovate to transversely oblong and elliptical, 2—10 mm long, stipules triangular-peltate, membranous, fringed. Flowers 3 mm broad, 3—1 in axills, short pedicelled; sepals rhombic, withemargined; petals lanceolate, rather shorter than the calyx; glands of the disk two-lobed, one-third as long as the petals; capsule depressed, glabrous. — Flow. March to April.

D. i. Wady-el-‘Arîsh; sandy places between Gebel Ekhfên and Gebel Halâl.

Local name: libbaney (Muschler).

Also known from Cyrenaica, Arabia Petraea and Syria.

862. (2.) **Andrachne aspera** Spreng. System. III (1825), p. 884. — Boiss. Flor. Or. IV, p. 1138. — Aschers.-Schweinf. Ill. Flor. d’Eg., p. 138 no. 971. — An perennial herb, 10—40 cm high, papillose-scabrous or hirtellous; branches rigid, slender, simple or branching. Leaves petioled, reniform to orbicular, 2—10 mm long, cordate at the base, the upper ones sessile, smaller. Flowers 3 mm broad, 3—1 in axills, short-pedicelled; sepals lanceolate, obtuse; petals shorter than the calyx; glands of the disk in male flowers peltate-reniform, in female obovate, truncate; capsule depressed, hirsute. — Flow. March to April.

D. a. sept. Near Suez in sandy places of the desert.

Local name: kimmsâsh.

Also known from Nubia, Abyssinia and tropical Arabia and Arabia Petraea.

335. (7.) **Euphorbia** Linn.

Apparent flower consisting of a number of stamens (really male flowers, each consisting of a single stamen jointed to a pedicel and soon falling away from it, without or rarely with a minute perianth just above the articulation) mingled with membranous scales or bracteoles, with or without a stalked ovary (really a pedicellate female flower, with or without a minute 3-lobed or very rarely cup-like or tubular perianth at the base of the ovary, but without a membranous tubular involucre surrounding the pedicel) in their midst, contained in a calyx-like cup-shaped involucre, the whole resembling a small hermaphrodite or male flower. Involucre consisting of a cup with an outer series of 2—8 (usually 5) glands, distinct and equally spaced or rarely united, entire, 2-horned, petal-like or divided, alternating with a inner series of 4—8 (usually 4) membranous erect or inflexed fringe-toothed lobes. Anthers 2-celled; cells usually subglobose and more or less diverging, longitudinally dehiscent. Ovary partly or wholly included or exserted, 3-(rarely 2-)

celled, with a single ovule in each cell, pendulous from the apex of the inner angle; styles 3, rarely 2, free or more or less united below, entire or bifid at the apex. Fruit a 3-(rarely 2-)celled capsule; cells separating at maturity from the central persistent axis and opening along their inner face into 2 valves, liberating the seed; inner part of the valves hard or cartilaginous. Seed with a thin crustaceous testa, smooth or variously sculptured, usually carunculate at the hilum; embryo straight, with flat cotyledons, enclosed in a thick albumen. — Herbs, shrubs or trees, very variable in habit, leafy or leafless, often succulent or cactus-like, with copious milky juice. Leaves alternate or the upper or all opposite, entire, toothed or rarely lobed. Stipules present or absent, in the succulent species often transformed into prickles or spines above a larger pair of spines. Involucres solitary and terminal or axillary or in the forks of the stems, or clustered in the axils of leaves or spines, or in cymes, which are axillary or terminal, simple, umbellike, paniculate or rarely whorled, very rarely in axillary racemes.

Species about 1000, dispersed throughout the warmer and temperate regions.

The cup-like involucre of this genus, which so closely resembles the calyx of a hermaphrodite flower, is really composed of two alternating whorls of 4—5 (rarely more) bracts fused together, the outer whorl terminating in the 4—5 glands and the inner whorl in the fringed or ciliate lobes. Occasionally abnormal flowers may be met with in which this is clearly shown, by one or more of the outer whorl being nearly or quite free to the base and tipped with a rudimentary gland.

A. Leaves stipulate. — Sect. *Anisophyllum*: All the leaves opposite, oblique at the base. Stipules lanceolate or linear. Glands appendaged.

I. Leaves oblong-rhombic. 1. *E. Peplis*.

II. Leaves obovate.

a) Stipules lanceolate 2. *E. granulata*.

b) Stipules setaceous 3. *E. indica*.

III. Leaves ovate to suborbicular 4. *E. chamaesyce*.

IV. Leaves oblong-elliptical 5. *E. aegyptiaca*.

B. Leaves not stipulated.

I. Sect. *Tirucalli*: Leaves obsolete or squamiform; the floral ones opposite or ternate. Glands not appendaged. Fleshy shrubs

6. *E. mauritanica*.

II. Sect. *Tithymalus*: Leaves opposite, or scattered, not stipuled, the floral ones

opposite or whorled. Glands not appendaged, entire, or truncate 2 horned.

- a) Glands truncate-2-horned. Inflorescence umbelled. Caruncle of the seed conical, elongated, longitudinally grooved 7. *E. cornuta*.
- b) Glands transversely ovate, with rounded margin, not 2 horned. Inflorescence umbelled. Annales or peremials.
 - 1. Seeds smooth 8. *E. arguta*.
 - 2. Seeds netted-wrinkled 9. *E. helioscopia*.
- c) Glands truncate, retuse, or more or less 2-horned. Inflorescence umbelled rarely dichotomous.
 - 1. Seeds tubercled.
 - a) Leaves obovate - spatulate, obtuse 10. *E. parvula*.
 - β) Leaves linear-lanceolate, acute 11. *E. dracunculoides*.
 - 2. Seeds longitudinally grooved, or with longitudinal rows of pits.
 - a) Leaves petioled.
 - † Leaves obovate 12. *E. Peplus*.
 - †† Leaves orbicular 13. *E. peploides*.
 - β) Leaves sessile or nearly so . . 14. *E. chamaepeplus*.
 - 3. Seeds irregularly pitted, mottled, or netted-winkled 15. *E. punctata*.
 - 4. Seeds smooth.
 - a) Floral leaves ovate-elliptical . 16. *E. Terracina*.
 - β) Floral leaves cordate-ovate . . 17. *E. Paralias*.

III. Sect. *Poinsettia*. — Upper leaves opposite or whorled. Stipules glandular. Cymes terminal corymbiform. Glands not appendiculated 18. *E. prunifolia*.

863. (1.) **Euphorbia Peplis** L. ap. Wimann Dissert. Euphorb. no. 21 and Spec. Plant., p. 652. — Boiss. Flor. Or. IV, p. 1086. — Rehbch. Ic. V, fig. 4753. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 137 no. 956. — Aschers.-Schweinf. Illustr. Flor. d'Eg., Supplem. p. 772. — Sickenberg. Contrib. Flor. d'Eg., p. 275. — A glabrous annual, of a glaucous or purple hue; the very short main stem loses all its leaves before flowering, and divides close to the base into an umbel of 3 or 4 rays, so that the whole plant appears to consist of the repeatedly forked flowering branches, closely prostrate on the sand, and forming patches of 12—30 cm or more in diameter. Floral

leaves opposite, numerous, very oblique, broadly oblong, very obtuse and rather thick, with minute stipules at their base. Flower-heads very small. Glands of the involucre expanding into small, whitish or purple scales. Capsule glabrous and smooth. Seeds not pitted. — Flow. March to April.

M. ma. Alexandria-West and -East. — **M. p.** Brullus.

Local name: libbeyn.

In maritime sands, all round the Mediterranean, and up the western coasts of Europe to the English Channel.

864. (2.) **Euphorbia granulata** Forsk. Flor. aeg.-arab. (1775), p. CXII and p. 94. — Boiss. Flor. Or. IV, p. 1087. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 137 no. 957. — Sickenberg. Contrib. Flor. d'Eg., p. 275. — Boiss. in DC. Prodröm. XV. II, p. 33. — Euphorbia Forskålei Gay in Webb & Berth. Phyt. Canar. III, p. 240. — Euphorbia prostrata Hiern. in Cat. Afric. Plant. Welw. I, p. 942 not Ait.-Euphorbia fragilis Decsne in Ann. Scienc. Nat., 2 sér. Vol. II p. 241. — Anisophyllum Forskålei Klotzsch and Garecke in Abhdg. Akad. Wiss. Berlin (1859), p. 25 partly. — Euphorbia Kralikii Batt. and Trab. Flor. Alg. I, p. 791. — An annual herb. Stems spreading on the ground. 2 to 18 cm long, simple or with alternate branches, sometimes thickened or with ring-like marks at the nodes, thinly or thickly pubescent all round with very spreading straight hairs. Leaves opposite, very shortly petiolate, 2—15 mm long, 1—6 mm broad, oblong or obovate-oblong, obtusely rounded at the apex, very unequal at the base, entire, puberulous on both sides (sometimes thinly) with adpressed or spreading and usually minute hairs. Stipules subulate, ciliate, sometimes minute and inconspicuous. Inflorescence of very short leafy raceme-like branchlets in the axils of and sometimes not longer than the leaves of the primary branches, with one involucre to each pair of reduced leaves. Peduncles 5—10 mm long. Involucre 10 to 15 mm long, campanulate or somewhat funnel-shaped, green, with 5 paler stripes and together with the peduncle puberulous with minute curved hairs, with 4 or occasionally 3 glands and 5 deltoid ciliate lobes; glands minute, transverse, narrowly half surrounded by an entire or slightly 2—3-lobed petal-like appendage. Capsule 5—8 mm in diam., puberulous all over with minute adpressed or spreading hairs. Seeds about 1 mm long, 4-angled, slightly transversely rugose or scrobiculate. — Flow. January to March.

N. v. Aswân: Cataracts. — **D. i.** Sâlihiya; Ismailia. — **D. a. sept.** Wady-et-Te'b; Wady Dugla; Wady Gerrâwy. — **D. a. mer.** Qoseyr; Wady Tundeba.

Local name: libbêyn (Klunzinger).

Also known from Algeria, Tunisia, Tripolitania; Arabia Petraea and Syria.

865. (3.) **Euphorbia indica** Lam. Encyclop. II (1786), p. 423. — Boiss. Flor. Or. IV, p. 1088. — Boiss. in DC. Prodrum. XV fasc. II, p. 22, incl. var. *angustifolia* Boiss. — *Euphorbia indica* var. *pubescens* Pax in Engler Bot. Jahrb. XIX, p. 117. — *Euphorbia decumbens* Forsk. Flor. aeg.-arab., p. CXII. — Willd. Enum. Plant. Hort. Berol., Supplem. p. 27. — *Anisophyllum hypericifolium* Haw. Syn. Plant. Succ., p. 161. — *Euphorbia hypericifolia* L. Spec. Plant. I, p. 454 (?). — Annual, erect, 6—28 cm high, branching at the base or sometimes simple; stems simple or alternately branching, puberulous or glabrous. Leaves opposite, 1—2½ cm long including the very short petiole, 4—8 mm broad, oblong, linear-oblong, oblong-lanceolate, elliptic or ovate, subacute to rounded at the apex, oblique at the base, minutely toothed or rarely entire, puberulous or glabrous on one or both sides. Stipules variable. Cymes axillary, 4—10 mm in diam., laxly few- to densely many-flowered. Peduncles 2—5 mm long, puberulous or glabrous, often with a pair of leaves at the apex. Bracts 1—2 mm long, lanceolate, acuminate, ciliate or entirely glabrous. Involucres about 1 mm long, cup-shaped, puberulous or glabrous, with 4 appendaged glands and 5 deltoid-subulate ciliate lobes: glands minute, orbicular or transversely elliptic; appendages spreading, transversely elliptic, 5—6 mm broad, entire, white. Capsule 2 mm in diam., pubescent or glabrous; styles deeply bifid. Seeds ellipsoid, 4-angled, slightly transversely rugose, reddish-brown with a glaucous hue to whitish-grey. — Flow. March to April.

N. v. Assiut, in Palm-gardens as a common weed; Kene.

Local name: libbêyn.

Also known from tropical Africa and Arabia.

866. (4.) **Euphorbia chamaesyce** L. Spec. Plant. I (1753), p. 115. — Boiss. Flor. Or. IV, p. 1088. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 772. — Sickenberg. Contrib. Flor. d'Eg., p. 275. — Sibth. and Smith Flor. Graec., tab. 461. — Rehbch. Ic. Germ., tab. 131. — *Euphorbia Massiliensis* DC. Flor. Franç. V, p. 357. — *Euphorbia canescens* L. Spec. Plant. I, p. 652. — Cavan. Diss. Ic., tab. 63. — An annual herb, 20—40 cm high, sometimes somewhat more, more or less hirsute to canescent, branching from the neck; branches filiform. Leaves ovate to suborbicular, 2—8 mm long, unequal at the base, obtusely crenulate; stipules setaceous, often with a small tooth at the base. Involucres solitary in the forks and upper axils, turbinate, 1,5 mm long, glabrous or hirsute, ciliate at the throat, lobes ovate-triangular, fringed; glands transverse, wax-coloured, somewhat concave, appendix as broad or narrower, more or less trilobed; capsule glabrous or hirsute, 1,5 mm long, carpels keeled. — Flow. March to April.

N. d. Cairo, as a weed in gardens.

Also known from Morocco, Algeria, Tunisia, Mediterranean region of Europe, Asia Minor, Caucasias, Armenia, Syria, Mesopotamia and Persia.

867. (5.) **Euphorbia aegyptiaca** Boiss. Cent. Euphorb. (1866), p. 13. — Flor. Or. IV, p. 1088. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 137 no. 957. — Sickenberg. Contrib. Flor. d'Eg., p. 275. — Boiss. in DC. Prodr. XV fasc. II, p. 35. — Euphorbia Forskålîi Gay in Webb and Berthol. Phyt. Canar. III, p. 240 partly. — Euphorbia Burmanniana Gay in Webb and Berth. Phyt. Canar. III, p. 239. — Annual. Stems spreading on the ground, $2\frac{1}{2}$ —20 cm long, with alternate branches, puberulous all round with minute curved and scarcely spreading hairs or with longer soft or slightly woolly hairs. Leaves opposite, shortly petiolate, 3—10 mm long, 5—6 mm broad, oblong, rounded or obliquely subacute at the apex, very unequal at the base, usually slightly toothed, sometimes entire, puberulous or pubescent on both sides or glabrous above. Stipules all free or rarely those on the under side of the stem united, usually cut into 2 or more segments. Inflorescence as in *E. chamaesyce*. Peduncles 4—5 mm long. Involucre 1 mm in diam., obconic-campanulate or globose-campanulate, more or less open down one side for the extrusion of the capsule, with 4 glands and 5 lobes, minutely puberulous or submentose; glands minute, transverse, with their appendages very reduced or obsolete. Capsule 1 mm in diam., thinly adpressed-puberulous or submentose all over, especially when young, sometimes becoming nearly glabrous, its pedicel included in or scarcely longer than the involucre; styles 2—3 mm long, spreading, bifid. Seeds 5 mm long, 4-angled, transversely rugulose, whitish or glaucous on a pale reddish ground. — Flow. January to March.

M. p. Damietta. — **N. d. N. v.** Common on way-sides. — **O.** Farâfra; Dakhel; Great Oasis. — **D. a. sept.** Wady Abady.

Local name: libbêyn; riglet-iblis.

Also known from Tropical Africa to India.

868. (6.) **Euphorbia mauritanica** Lam. Encyclop. II (1786), p. 468. — Boiss. in DC. Prodr. XV, fasc. II p. 94. — Aschers.-Schweinf. Ill. Flor. d'Eg., Suppl. p. 771 no. 1318. — Sickenberg. Contrib. Flor. d'Eg., p. 275. — Plant. aegypt. Prosp. Alpino, tab. XXX. — Forsk. Flor. aeg.-arab., p. LIII. — A shrubby plant. Stems several, spreading on the ground, 40—80 cm long, with alternate branches, often, but not always, slightly flattened from above, puberulous on the upper side, at least along a middle line, with minute curved hairs, glabrous on the under side. Leaves opposite, shortly petiolate, $2\frac{1}{2}$ — $6\frac{1}{2}$ mm long, 1—4 mm broad, oblong to elliptic or slightly oblong-obovate,

obtuse or rounded at the apex, distinctly or obscurely toothed, sometimes ciliate, glabrous on both sides or with a few scattered hairs beneath, chiefly near the apex. Stipules on the upper side of the stem usually free, those on the lower side united into one deltoid or deltoid-ovate body, toothed at the apex. Inflorescence of short axillary leafy raceme-like branchlets, with 1 axillary involucre to each pair of reduced leaves, sometimes reduced to a cluster of 2—3 involucre on a short peduncle, with 2—3 pairs of minute spatulate leaves. Peduncles 1—2 mm long, glabrous. Involucre 5—6 mm long, campanulate, glabrous or very thinly pubescent, with 4 glands and 5 lobes; glands minute, with the appendage just exceeding their margin or obsolete. Capsule 1—3 mm in diam., pubescent with spreading hairs along the somewhat acute angles, glabrous on the sides. Seeds 1 mm long, 4-angled, transversely wrinkled, pale reddish. — Flow. March to April.

M. p. Brullus.

Local name: leben-el-eshâr; felfel tawîl; fulfeyleh (Ascherson). — Cultivated in gardens since Forskål.

Also known from Arabia.

869. (7.) **Euphorbia cornuta** Pers. Synops. II (1807), p. 17. — Boiss. Flor. Or. IV, p. 1093. — Aschers. Flor. Rhinocol., p. 804 no. 232. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 137 no. 960. — An annual plant 25—40 cm high, sometimes perennant, glabrous, glaucescent. Leaves somewhat fleshy, sessile, linear to ovate-oblong, 2—3 cm long, acute or retuse, more or less acutely serrate. Rays of umbel 2—3, several times forked; floral leaves dilated and cordate at the base, caudate-acuminate, pectinate-serrate, usually recurved at the tip; involucre campanulate, with triangular, fringed lobes; glands somewhat concave, transversely ovate, with 2—4, short horns at the edge, or palmately 6—10-cleft; capsule 6 mm long, carpels rounded. — Flow. March to April.

M. p. El-'Arîsh: Damietta; Wady Sath. — **D. l.** Between Bir Leluk and Bir Hamâm; Abu Roash; Pyramids of Giza. — **D. i.** Sâlibiya; Ismailia. — **D. a. sept.** Cairo; Helwân; Suez; Beni-Suêf; Southern and Northern Galala; often common in the Wadies.

Local name: melbeyn; no'maniye (Forsk.); libbeyn (Ehrenberg); na'maniye; wirk-ed-dhab.

Algeria, Tunisia, Tripolitania, Arabia Petraea.

870. (8.) **Euphorbia arguta** Soland. in Russell Natur. Histor. Aleppo ed. 2 Vol. II (1756), p. 253. — Boiss. Flor. Or. IV, p. 1097. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 127 no. 961. — Sickenberg.

Contrib. Flor. d'Eg., p. 275. — Sibth. and Smith Flor. Graec. V, tab. 468. — Boiss. in DC. XV fasc. II, p. 117. — *Euphorbia calendulaefolia* Del. Illustr. Flor. d'Eg., p. 89 tab. 30 fig. 1. — *Tithymalus calendulaefolus* Klotzsch and Garcke in Abhdlg. Akad. Berl. (1860), p. 74. — Annual, 6—25 cm high; stem simple or branching at the base, divided at the top into an umbel of 3—5 rays, with or without 1 or more rays in the axils of the upper stem-leaves, thinly pilose with long fine hairs, sometimes almost glabrous. Leaves alternate, sessile, lanceolate, oblong-lanceolate, obovate or cuneately oblanceolate, acute or obtuse, sharply serrate, thinly pilose on one or both sides (at least along the midrib) to nearly glabrous. Stipules none. Rays of the umbel $4\frac{1}{2}$ —10 cm long, cymosely 2—4 times divided. Bracts opposite or 3 in a whorl, sessile, ovate, usually acute, broadly rounded to subcordate at the base, serrate, glabrous on both sides or slightly pilose at the very base. Involucre solitary, sessile or subsessile, about $2\frac{1}{4}$ mm in diam., cup-shaped, with 4 glands and 5 transversely rectangular or subquadrate fringed lobes, glabrous; glands 3—5 mm in their greater diam., transversely oblong, entire. Capsule erect, 5 mm in diam., glabrous; styles variable. 3—5 mm long, free to the base, bifid at the apex. Seeds about $2\frac{1}{4}$ mm long, ellipsoid, nearly smooth, but with a very faint indication of reticulation, dark brown, with a shortly stalked peltate circular caruncle. — Flow. March to April.

N. d. N. f. N. v. Common on way-sides and often in fields. — **O.** Little Oasis; Farâfra; Dakhel; Great Oasis. — **D. l.** Bir Leluk; Kafr-Hakîm; Abu-Roash; Pyramids of Giza; Pyramids of Saqqâra. — **D. a. sept.** Suez.

Local name: libbeyn.

Also known from Tropical Africa and Arabia Petraea.

871. (9.) ***Euphorbia helioscopia*** L. ap. Wiman Diss. Euphorb., no. 42. — L. Spec. Plant., p. 658. — Boiss. Flor. Or. IV, p. 1107. — Rehbeh. Ic. V, fig. 4754. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 137 no. 962. — An erect or ascending annual, 10 or 18—30 cm high, simple or with a few branches ascending from the base. Stem-leaves obovate or broadly oblong, and narrowed into a short stalk; floral leaves broadly obovate or orbicular, all very obtuse and minutely toothed. Umbel of 5 rays, each ray once or twice forked at the end, but the branches so short that the flowers and floral leaves appear crowded into broad, leafy heads. Glands of the involucre entire and rounded. Capsules glabrous and smooth. Seeds pitted. — Flow. March to April.

N. d. N. v. Common on waste places.

Everywhere in all places in the Mediterranean region and Europe.

872. (10.) **Euphorbia parvula** Delile Illustr. Flor. d'Eg. (1813), p. 235 tab. 30 fig. 4. — Boiss. Flor. Or. IV, p. 1109. — Boiss. in DC. Prodom. XV fasc. II, p. 139. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 137 no. 963. — Sickenberg. Contrib. Flor. d'Eg., p. 275. — Euphorbia exigua Coss. in Bull. Soc. Bot. XXXVI, p. 96 not L. — An annual plant, 5—10 cm high, glabrous; stem simple or branching below. Leaves entire, obovate-spathulate, 5 mm to 1 cm long, obtuse or retuse, mucronulate, the umbellar oblong-spathulate. Rays of the umbel 2—3, several times bifid; floral leaves oblong-lanceolate, acute; involucre minute, turbinate, lobes oblong, ciliate; glands rather concave, transversely ovate, with 2, short or obsolete horns; capsule oblate-spheroid, 1.5 mm broad, carpels rounded. — Flow. March to April.

M. ma. Matruqa; Mariut; Alexandria-West and -East. — **M. p.** Qatīya.

Local name: na' amīya.

Also known from Tripolitania, Cyrenaica and Western Marmarica.

873. (11.) **Euphorbia dracunculoides** Lam. Encyclop. II (1786), p. 428. — Boiss. Flor. Or. IV, p. 1110. — Boiss. in DC. Prodom. XV fasc. II, p. 139. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 137 no. 964. — Boiss. Ic. Euph., p. 21 tab. 91. — Sickenberg. Contrib. Flor. d'Eg., p. 275. — Tithymalus dracunculoides Klotzsch and Gareke in Abhdlg. Akad. Berlin (1860), p. 84. — Annual, erect, 6—25 cm high, with the main branches alternate or opposite, ascending-spreading, dichotomously branched, terete, glabrous in all parts. Leaves opposite on all the flowering parts, alternate on some of the lower parts of the stem and branches, sessile, 1—3 cm long, 1—7 mm broad, linear or linear-lanceolate, acute or obtuse, rounded in at the base, apparently somewhat glaucous. Stipules none. Involucres solitary at the forks or ends of the branches, subsessile or shortly pedunculate, 1—2 mm in diam., cup-shaped, with 4 glands and 5 ovate-oblong or subquadrate fringed lobes, glabrous outside; glands about 3—5 mm in their greater diam., transverse, narrowly oblong or half-moon-shaped, 2-horned. Capsule about $2\frac{1}{2}$ mm in diam., exserted on a recurved pedicel twice as long as the involucre, glabrous; styles 3—4 mm long, free to the base, deeply bifid, erect, with recurved tips. Seeds 2— $3\frac{1}{4}$ mm long, ellipsoid or ovoid, obtuse, white-rugose with a few smooth dark brown or dull green markings and with a peltate caruncle. — Flow. March to April.

D. a. mer. Edfu; Wady Abady.

Also known from Tropical Africa and Arabia.

874. (12.) **Euphorbia Peplus** L. ap. Wiman Dissert. Euphorb., no. 27. — L. Spec. Plant., p. 658. — Boiss. Flor. Or. IV, p. 1112. — Rehbch. Ic. V, fig. 4775. — An annual plant, 20–30 cm high, sometimes somewhat more, glabrous, branching, erect. Leaves tender, entire, petioled, obovate, 5 mm to 2.5 cm long, obtuse or retuse. Rays of the umbel 3, several times forked; horns much longer than breadth of glands; capsules ovate, 1.5 mm long, deeply 3-grooved, carpels compressed, with two wing-like keels. — Flow. March to April.

M. ma. Abusir; Montaza; Mariut; Alexandria-West and -East; Abukir. — **N. d. N. f. N. v.** Often a weed in gardens. — **O.** Little Oasis; Farâfra; Dakhel; Great Oasis.

Local name: ma'laqah (Forsk., Del.); libbeyn (Aschers.-Schweinf.); wudeyna; zorreyq (Ascherson); generally: sâbûn-ghey't (Schweinfurth).

Also known from Morocco, Algeria, Tunisia; Europe and Arabia Petraea.

var. **maritima** Boiss. in DC. Prodrôm. XV fasc. II (1864), p. 140. — Flor. Or. IV, p. 1112. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 137 no. 965. — Euphorbia peploides Griseb. Spicil. Fl. Rum. I, p. 138 not Gouan. — Less procumbent; leaves more fleshy and rotundate. — Flow. March.

M. ma. Alexandria.

Local name: libbeyn.

Also known from Greece.

875. (13.) **Euphorbia peploides** Gouan. Flor. Monsp. (1765), p. 174. — Boiss. Flor. Or. IV, p. 1112. — Rehbch. Ic. V, fig. 4774. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 138 no. 966. — Sickenberg. Contrib. Flor. d'Eg., p. 276. — Euphorbia Peplus var. peploides Coss. ap. Bonn. and Barr. Catal. Plant. Tunis., p. 383. — Euphorbia Peplus var. minor Viv. Flor. Libye., p. 26. — Would appear to be a more round-leaved variety of the last, with almost no style, and a smaller seed, with fewer pits. — Flow. March to April.

M. ma. Umm Rakum; Matruqa; Abusir; Mariut; Alexandria-West and -East.

Also known from all the other parts of the Mediterranean region and Asia Minor.

876. (14.) **Euphorbia chamaepeplus** Boiss. and Gaill. in Diagnos. Plant. Or., Ser. II, fasc. IV (1842), p. 88. — var. **sinaica** Boiss. in DC. Prodrôm. XV fasc. II (1864), p. 141. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 138 no. 967. — Sickenberg. Contrib. Flor. d'Eg., p. 276. — Aschers.-Schweinf. Ill. Flor. d'Eg., Suppl. p. 772. — Aschers. Flor. Rhinocol., p. 894 no. 233. — Boiss. Flor. Or. IV, p. 967. —

An annual plant, 5—15 cm high, glabrous, erect, branching from the base. Leaves sessile or short-petioled, obovate to elliptical, 5 mm to 1 cm long, obtuse or retuse. Rays of the umbel 3, short, bifid; floral leaves oblong; horns slender, somewhat longer than breadth of glands; capsule ovate, 1.5 mm long, carpels rounded. Pits of the obscurely hexagonal seed irregularly arranged. — Flow. March to April.

M. p. El-'Arish. — **D. i.** Wady-el-'Arish; Brullus. — **D. a. sept.** Galala.

Local name: libbeyn.

Also known from Sinai.

877. (15.) **Euphorbia punctata** Delile Illustr. Flor. d'Eg. (1813), p. 289 tab. 30 fig. 3. — Boiss. Flor. Or. IV, p. 1114. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 138 no. 968. — Sickenberg. Contrib. Flor. d'Eg., p. 276. — An annual, glabrous herb, 30—35 cm high, pale green, branching from the base; umbells ternate with short rays; leaves obsolete, subsessile, obovate, retuse, obtuse; the floral-ones larger, deltoid obtuse, mucronulate; capsule ovate deeply trisulcated; seeds ovate, small, oblong, foveolate without a caruncula. — Flow. March.

M. ma. Marmarica: Matruqa; Dakalla; Mariut; Alexandria; Ramle.

Only known from this locality.

878. (16.) **Euphorbia Terracina** L. Spec. Plant. I (1753), p. 654. — var. **prostrata** Boiss. Flor. Or. IV, (1879), p. 1123. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 138 no. 969. — Sickenberg. Contrib. Flor. d'Eg., p. 276. — Aschers. Flor. Rhinocol., p. 864 no. 234. — A perennial herb, 50 cm to 1 m high, glabrous; branches from the base, erect or ascending. Leaves oblong to linear-lanceolate, or oblong-linear, 1—4 cm long, mucronulate, serrulate above middle, sometimes truncate-retuse. Rays of umbel 3—5, several times forked; umbellar leaves ovate-elliptical; floral ones half-round or ovate-triangular; horns longer than breadth of the gland; capsule broader than long, 4 mm broad, 3-lobed, carpels keeled. — Flow. March to April.

M. ma. Matruqa; Abusir; Behig; Alexandria-West and -East. —

M. p. Rosetta; El-'Arish; Tawil-es-sakhâm; Sheyk Zoyêd; Sheykh Djubaiah.

Also known from the other parts of the Mediterranean region.

879. (17.) **Euphorbia Paralias** L. ap. Wiman Dissert. Euph., no. 53. — L. Spec. Plant. I, p. 657. — Boiss. Flor. Or. IV, p. 1130.

— Aschers.-Schweinf. Ill. Flor. d'Eg., p. 138 no. 970. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 772. — Sickenberg. Contrib. Flor. d'Eg., p. 276. — An perennial herb, 30—50 cm high, sometimes somewhat more, glabrous, glaucous, many-stemmed from a branching root; stems erect, stiff, densely beset with imbricated leaves. Leaves leathery, entire, elliptical-obtuse to oblong-acute, 1—2 cm long, 3—6 mm broad; umbellar leaves cordate-ovate. Rays of umbel 3—5, thick, short, twice to thrice bifid; floral leaves cordate-reniform, mucronulate; horns short, spreading; capsule broader than long, 6 mm broad, 3-lobed, carpels rounded. — Flow. March to April.

M. ma. Marmarica: Matruqa; Dakalla; Montaza; Mariut; Alexandria-West; Abukir. — **M. p.** Brullus.

Local name: lubbeyn (Ascherson); shegret-el-hanash (Ascherson).

Also known from the other parts of the Mediterranean region, and along the Ocean coast from Spain to England.

880. (18.) **Euphorbia prunifolia** (Jacq.) Muell. Arg. in Mart. Flor. Brasil. XI (1873—1874), p. 694. — Jacq. in Hort. Schoenbr. III, tab. 277. — Rehbch. Hort. Bot., tab. 174. — *Euphorbia geniculata* Ortega Dec., p. 18. — Boiss. in DC. Prodrum. XV, 2, p. 72. — Aschers.-Schweinf. Illustr. Flor. d'Eg., p. 137 no. 959. — Sickenberg. Contrib. Flor. d'Eg., p. 275. — *Euphorbia elliptica* Lam. Dict. II, p. 425 not Thunbg. — *Euphorbia frangulaefolia* H. B. K. Nov. Gen. II, p. 49. — *Poinsettia geniculata* Klotzsch and Garcke Tricocc., p. 101. — Stems herbaceous, erect, dichotomously branched; leaves alternate, petiolate; the upper ones opposite; stipules glandular; pedicels as long as the involucre; involucre cylindrical-obovate, at the base acute, glabrous, lobes ovate, incise-lanate, erect; cymes 5—8-flowered; ovary glabrous, style 2-partite; capsules glabrous; seeds broadly trigonous. — Flow. March to April. — Very poisonous.

M. ma. Alexandria-West and -East. — **N. d.** Alexandria; Qalyub; Matariya. — **N. v.** Old Cairo; Luksor as a weed in gardens and in cotton-fields.

Local name: libbeyn-er-roqabiya.

Introduced from South America.

335 A. **Jatropha** Linn.*).

Flowers in terminal cymes, monoecious, the central in the cyme or its fork usually female, often petaliferous. Male flower: Sepals 5.

*) Following Sickenberger in Herb. Zuerich the two species of *Jatropha* are often naturalized in **M. ma.** and **N. d.** — As I have never seen these species naturalized, I have not given a special number to this genus.

imbricate, often petaloid. Petals 5, contorted, free or connate. Disk entire or of 5 glands. Stamens many, filaments of all or of the interior ones only, connate, anthers erect. Pistillode none. Female flower: Perianth of the male. Ovary 2—4-celled; styles connate below, 2-fid, lobes entire or 2-lobed; ovules 1 in each cell. Capsule of 2—4 2-valved cocci, endocarp crustaceous or bony. Seeds ovoid or oblong; testa crustaceous, albumen fleshy; cotyledons broad, flat. — Herbs, shrubs or trees, often glandular and prickly. Leaves alternate, entire or digitately lobed or partite; stipules often ciliate.

Species chiefly American.

A. Leaves palmately cut into many narrow lobes . . . 1. **J. multifida**.

B. Leaves orbicular-cordate, entire or 3—5-lobed or angled 2. **J. Curcas**.

881. (1.) **Jatropha multifida** L. Spec. Plant. I (1753), p. 1006. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 138. — Sickenberg. Contrib. Flor. d'Eg., p. 278. — A large shrub or small tree, glabrous. Leaves 6—10 cm in diameter, orbicular in outline, palmately cut into many narrow entire or lobulate cordate-acuminate segments, glaucous beneath; petiole as long as the blade; stipules capillary multifid eglandular; bracts and entire sepals glabrous. Cymes on long peduncles; flowers scarlet; anthers linear. Disk of female flowers urceolate. — Flow. February to March.

M. ma. N. d. N. f. N. v. Rarely cultivated in gardens. Naturalized (Sickenberger in Herb. Zuerich).

Also known from the Tropics of both the New and Old World.

882. (2.) **Jatropha Curcas** L. Spec. Plant. I (1753), p. 1006. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 138. — A large shrub or small tree, glabrous except the young shoots. Leaves orbicular-cordate, 8—16 cm diameter, entire or 3—5-lobed or angled, lobes obtuse or acute, quite entire; petioles as long as the blade. Cymes or panicles terminal, glabrous or pubescent. Flowers yellow; corolla-tube of the male one villose within. Males at the end of the ramifications, females at the divisions. Ovary and styles glabrous. Capsule 2—2½ cm long and nearly as broad. Seeds nearly black. — Flow. March to April.

M. ma. N. d. N. v. Rarely cultivated in gardens. Naturalized (Sickenberger in Herb. Zuerich).

Local name: habb-el-melük.

Also known from the Tropics of the both the New and Old World.

Sapindales.

Shrubs or trees, or rarely herbs. Leaves various: blades simple and entire, toothed or pinnately divided in the case of annual herbs,

or compound. Calyx of distinct sepals. Corolla of distinct petals, regular or rarely irregular, or wanting. Androeceium of as many stamens as there are petals, or twice as many, or rarely more or fewer. Filaments distinct. Gynoeceium of one carpel or of several carpels united into a compound pistil. Ovary superior. Ovules 1 or 2, or several in each cavity of the ovary, pendulous, with the rhaphe away from the axis of the ovary, or erect or ascending.

57. Anacardiaceae.

Flowers unisexual, polygamous or hermaphrodite, usually regular. Calyx of 3—5 lobes or distinct sepals. Petals 3—7, rarely none. Disk usually annular or broad. Stamens of the same number or twice as many as petals, very rarely indefinite, inserted round the disk or rarely upon it; filaments free; anthers versatile. Ovary superior, usually 1-celled, with 1—3 styles, or 2-celled, or very rarely of 2 or more distinct carpels, or in male flowers reduced to 4 or 5 rudimentary style-like carpels. Ovules solitary in the ovary or in each of its cells, pendulous or broadly adnate to the side of the cavity, or suspended from a free funicle erect from the base of the cavity, with a dorsal rhaphe and inferior micropyle; very rarely erect, with a ventral raphe and inferior micropyle. Fruit superior or rarely half inferior, free or adnate at the base to the enlarged calyx-tube or disk, 1-celled or several-celled, usually drupaceous and indehiscent. Seed erect, horizontal or pendulous; albumen none or very thin. Embryo straight or incurved, cotyledons usually fleshy; radicle short, inferior or more frequently turned upwards or superior. — Trees or shrubs, the bark often exuding a caustic, balsamic or gummy juice. Leaves alternate or very rarely opposite, without genuine stipules, simple or ternately or pinnately compound, usually without glandular dots. Inflorescence various, usually paniculate, with small flowers. Flesh of the drupes usually oily or full of caustic juice.

A large family of tropical and warm countries, common to both hemispheres.

- | | |
|-----------------------------|-----------------------|
| A. Leaves ternate | 1. Rhus . |
| B. Leaves pinnate | 2. Pistacia . |
| C. Leaves simple | 3. Mangifera . |

336. (1.) **Rhus** Linn.

Flowers small, regular, polygamous. Calyx 4—6-partite, persistent; segments equal. Petals as many, spreading or erect, im-

bricate in aestivation. Stamens as many and alternate with the petals or 10, free, inserted in the annular disk; filaments subulate; anthers in the female flower usually rudimentary. Ovary sessile, globose or ovoid. Styles 3, free or connate, erect or appressed to the ovary. Ovule suspended from a basal funicle. Drupe usually small, dry or resinous. — Trees or shrubs, often abounding in resin. Leaves simple or 3-foliolate in the Egyptian species, alternate or rarely opposite or verticillate. Panicles axillary and terminal, usually many-flowered.

A large genus of both hemispheres, with numerous (about 50) species at the Cape.

883. **Rhus Oxyacantha** Cav. Icon. III (1794), p. 36. — Engler in DC. Monogr. Phanerog. IV, p. 437. — Aschers.-Schweinf. Ill. Flor. d'Ég., p. 59 no. 268. — *Rhus oxyacanthoides* Dum.-Cours. Bot. Cult. III, p. 568. — Boiss. Flor. Or. II, p. 5. — Coss. and Kral. in Bull. Soc. Bot. Franç. IV, p. 63. — A shrubby plant. Branches twisted, thorny, Leaves glabrous, ternate, the petiole a little shorter than the leaflets; the leaflets sessile, cuneate-obovate, obtusely few-lobed, dentate from middle to the apex. Racemes short, terminal; flowers dioecious; drupes shining, glabrous, globular. — Flow. January.

D. a. sept. Wady Abady; Gharib.

Local name: haushez; 'ausedj (Delile); 'erin (Wilkins.); 'ern (Schweinfurth).

Also known from Morocco, Algeria, Tunisia, Nubia and Syria.

337. (2.) **Pistacia** Linn.

Flowers dioecious, apetalous; the staminate with a 5-fid calyx, and five, short stamens, with large anthers; the pistillate with a 3—4-fid calyx. Styles short, trifid. Drupe 1-seeded, with a chartaceous epicarp, and bony pip. Seed compressed. — Trees or shrubs with a terebinthine gum, usually pinnate leaves, and axillary racemes or panicles.

A large genus widely distributed in the Tropics.

884. **Pistacia Khinjuk** Stocks in Kew Journ. IV (1852), p. 143. — var. **glaberrima** Schweinf. in Boiss. Flor. Or. Suppl. (1888), p. 154. — A small tree, 3—6 m high. Leaves all glabrous like the stems, impari-pinnate, of 1—2, rarely 3—6 pairs; petiole terete; leaflets oblique, broadly ovate or oblong, more or less long acuminate. Fruiting panicle straight; fruit small, 3 mm long, obovate-subcompressed, apiculate. — Flow. March.

Local name: bitm.

D. a. sept. Galala.

Also known from Persia, India to the Himalaya.

338. (3.) **Mangifera** Linn.

Calyx 4—5-partite; segments imbricate, deciduous. Petals 4—5, free or adnate to the disk, imbricate; nerves thickened, sometimes ending in excrescences. Stamens 1—5, rarely 8, inserted just within the disk or on it, 1 rarely more perfect and much longer than the others, the others with imperfect or smaller anthers, or reduced to teeth. Ovary sessile, 1-celled, oblique. Style lateral. Ovule pendulous, funicle basal, inserted on the side of the cell above the base, rarely horizontal. Drupe large, fleshy; stem compressed, fibrous. Seeds large, compressed; testa papery. Cotyledons plano-convex, often unequal and lobed. — Small-trees. Leaves alternate, petiolate, quite entire, coriaceous. Flowers small, polygamous in terminal panicles. Pedicels articulate. Bracts deciduous.

A small genus of India and the eastern Archipelago. The following species *Mangifera indica*, the Mango, is widely cultivated in tropical countries for the sake of its excellent fruit.

885. **Mangifera indica** L. Spec. Plant. I (1753), p. 1013. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 59. — DC. Prodr. II, p. 63. — A small tree, glabrous except the panicle. Branches widely spreading. Leaves oblong or linear-oblong, or elliptic or obovate-lanceolate, obtuse, acute or acuminate, 12—35 cm long, very variable in breadth; crowded at the ends of the branches, often shining; margins often undulate, the young growth usually coloured — a glossy purplish-brown. Petioles 3—8 cm long, swollen at the base. Panicles more or less pubescent. Bracts elliptic, concave. Flowers yellow, odorous, subsessile, rarely pedicellate, male and female in the same panicle. Sepals ovate, oblong, concave. Petals twice as long, ovate, ridges 3—5, orange. Disk fleshy, 5-lobed. Stamens 1, inserted upon the disk; filaments subulate; anthers purple. Ovary glabrous. Drupe, size, form and colour various. — Flow. January.

M. ma. Alexandria; Mahmudiya-canal; cultivated. — **N. d.** Cairo, rare in gardens.

Local name: mango; beydân (Schweinfurth).

Cultivated everywhere in the Tropics; of Indian origin.

58. **Sapindaceae.**

Flowers usually polygamous, regular or irregular. Sepals 4—5, rarely 0 or more numerous, free or more or less connate, often unequal, usually imbricated, sometimes valvate. Petals 3—5, rarely 0 or more numerous, equal or unequal, the lower ones often absent or smaller than the rest, imbricated, usually bearded or furnished with

a scale on the inner face. Disk various, complete or incomplete, sometimes 1-sided, rarely absent. Stamens 5—24, in the Egyptian species usually 8, usually inserted below the disk, sometimes unilateral, straight or declinate, sometimes inserted above the disk or round its base; the filaments usually elongated, filiform or subulate, often villose. Anthers oblong and didymous or linear and tetragonous, versatile or attached at the base. Ovary central or excentric, entire or more or less, often deeply, lobed, 1—4, usually 3-celled. Style terminal, simple or divided, straight or declinate, sometimes twisted; stigma usually simple. Ovules anatropous, campylotropous or amphitropous, usually solitary in the cells, ascending and affixed to the axis, with a usually ventral raphe and inferior micropyle, rarely horizontal or inverted, the funiculus usually tumid. Fruit capsular or indehiscent, drupaceous baccate or coriaceous, entire or lobed, rarely of 2—3 samaras, the valves dehiscing variously. Seeds globose or compressed, naked or arillate; testa various, often horny; albumen usually 0. Embryo usually thick, often plicate or spirally convolute. Cotyledons usually plano-convex, large and unequal, collateral or superposed; radicle short, inferior, mostly descending. — Often tall trees, rarely shrubs or herbs, sometimes climbing and cirrhiferous. Leaves alternate or sometimes opposite, often evergreen, usually without stipules, simple or compound, imparipinnate or equally pinnate. Inflorescence various. Flowers allways small and inconspicuous. Fruit occasionally edible.

An Order of 600—700 species, mostly tropical, but a very small proportion African.

- A. Stamens inserted inside the disk 1. *Cardiospermum*.
 B. Stamens inserted outside the disk 2. *Dodonaea*.

339. (1.) *Cardiospermum* Linn.

Flowers polygamous. Sepals 4, broadly imbricate, the 2 outer ones small. Petals 4, 2 larger with a large scale, 2 smaller with a crested scale. Disk one-sided, almost reduced to 2 prominent glands opposite the lower petals. Stamens 8, oblique. Ovary excentric, 3-celled, with one ovule in each cell; style very short, with 3 stigmatic lobes. Capsule vesicular, membranous, more or less 3-cornered, 3-celled, opening loculicidally. Seeds globose, with a thick funicle or small aril; testa crustaceous; cotyledons large, transversely folded. — Herbs or undershrubs, mostly climbing. Leaves dissected. Flowers few, small, on long axillary peduncles, which usually bear a tendril under the panicle.

A small genus, chiefly American, of which 2 species are also spread over the Old World within the Tropics, and a third is perhaps confined to the Old World.

886. **Cardiospermum Halicaccabum** L. Spec. Plant. I (1753), p. 925. — Boiss. Flor. Or. I, p. 945. — DC. Prodr. I, p. 601. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 58 no. 266. — A straggling or somewhat climbing annual or perhaps perennial, attaining several m in length, glabrous or slightly pubescent. Leaf-segments usually twice ternate, ovate or ovate-lanceolate, coarsely toothed or lobed, the upper leaves smaller, narrower, and less divided. Peduncles 4—6 cm long, bearing a double or treble short recurved tendril under the small panicle, which is often reduced to an umbel of few small white flowers. Capsules flat on the top, usually pubescent. — Flow. March.

N. d. Cairo, cultivated in old gardens. — **O.** Dakhel (Ascherson).

Local name: bakkef; nuffah (von Samson); taftaf (Gaillard).

Also known from all the parts of the Tropics.

340. (2.) **Dodonaea** Linn.

Flowers polygamous or unisexual, often dioecious. Sepals 5 or sometimes fewer, valvate in the bud. Petals none. Disk small or inconspicuous. Stamens usually 8, sometimes fewer, rarely 10; filaments very short, anthers ovoid or linear-oblong. Ovary 3 or 4, rarely 5 or 6-celled, with 2 ovules in each cell; style short, or in some flowers very long, shortly lobed at the end. Capsule membranous or coriaceous, opening septicidally in as many valves as cells, each valve with a dorsal angle often produced into a vertical wing, and in falling off leaving the dissepiment attached to the persistent axis, or rarely the dissepiment splitting and remaining attached to the valves, thus closing the carpels and leaving only the central filiform axis persistent. Seeds 1 or 2, nearly globular or more frequently compressed, with a thickened funicle, but not arillate; testa crustaceous; embryo spirally curled. — Shrubs, often tall, but scarcely truly arborescent; the young shoots usually viscid, and often the whole plant. Leaves simple or pinnate, with small leaflets, with or without a terminal odd one. Flowers terminal or axillary by the abortion of the flowering branches, solitary, clustered, or in short racemes or panicles.

With the exception of *D. viscosa*, which is widely dispersed over almost all hot countries, and possibly one distinct Sandwich Island species, one from S. Africa, and one or two from Mexico, the *Dodonaeas* are all endemic in Australia, and very difficult to distinguish by positive characters.

887. **Dodonaea viscosa** L. Spec. Plant. I (1753). p. 926. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 58. — DC. Prodröm. I, p. 616. — A shrub, sometimes low and stunted, more frequently tall, glabrous, and usually more or less viscid, the young branches frequently compressed or somewhat triangular. Leaves simple, varying from broadly oblong-lanceolate, acute or acuminate, and 6 or 8 cm long, to narrow-lanceolate, or oblong-cuneate and very obtuse or almost linear-cuneate, always narrowed into a more or less distinct petiole, entire or obscurely sinuate, or rarely almost 3-toothed at the end, the pinnate veins usually rather numerous and very divergent, sometimes scarcely conspicuous. Panicles or racemes usually short and terminal, or reduced to axillary clusters. Sepals ovate, usually as long as or rather longer than the oblong obtuse anthers. Style rarely lengthened out. Capsule very variable in size, the wings continued from the base to the style, or nearly so, either equally rounded at the top and at the base or more contracted at the base. Seeds rather large, dark-coloured or black, opaque or scarcely shining. — Flow. February.

N. d. Shubra, naturalized; Cairo, often cultivated in gardens. Also known from India.

Rhamnales.

Shrubs or small trees, or commonly vines. Leaves mostly alternate. Flowers regular, sometimes imperfect or incomplete. Calyx and corolla present, or the latter wanting. Androecium of as many stamens as there are sepals and alternate with them. Gynoecium a compound pistil, superior or mainly so. Fruit a capsule or a berry, or drupaceous.

59. Rhamnaceae.

Flowers regular, hermaphrodite, or rarely polygamous. Calyx campanulate, urceolate, or cylindrical, the tube persistent and often adnate to the ovary or disk; lobes 4 or 5, valvate, usually with a raised longitudinal line inside, and deciduous. Petals 4 or 5, concave or hood-shaped, inserted at the base of the calyx-lobes alternating with and rarely exceeding them, or none. Stamens 4 or 5, alternating with the calyx-lobes, inserted with the petals and opposite to them when present; filaments short, filiform; anthers small, often enclosed in the petals, rarely oblong or exserted. Disk rarely wanting, usually filling the calyx-tube or lining it, or annular round the ovary when inferior, rarely cup-shaped and free. Ovary sessile on the disk or immersed in it, or more or less inferior,

3-celled, or rarely 2 or 4-celled; style short, entire, or with as many lobes or branches as ovary-cells; stigmas terminal, capitate or club-shaped. Ovules solitary in each cell, erect, anatropous, with a dorsal or rarely lateral raphe. Fruit a drupe or capsule, the border of the adnate base of the calyx forming a ring at the base or round the fruit or at the summit; epicarp thin and dry or fleshy; endocarp separating into as many membranous coriaceous or hard cocci as cells, or woody or bony, divided into cells. Seeds solitary, erect, usually ovate and somewhat compressed, often arillate; testa coriaceous or crustaceous and shining or rarely membranous; albumen fleshy or almost horny, often scanty, rarely wanting; embryo usually straight, with flat rather thick cotyledons and a short inferior radicle. — Shrubs or trees, very rarely, in genera not Egyptian, herbs erect or climbing. Leaves alternate or rarely opposite, undivided, entire, or toothed. Stipules usually present but very deciduous, rarely spinous and persistent. Flowers small, usually green or yellowish, in cymes or umbel-like clusters, either solitary or forming axillary or terminal compound cymes, racemes or panicles.

A considerable Order, ranging over the tropical and temperate regions of both the New and the Old World.

- A. Leaves 3—5-nerved from the base 1. *Zizyphus*.
 B. Leaves pinninerved 2. *Rhamnus*.

341. (1.) *Zizyphus* Juss.

Flowers hermaphrodite or polygamous. Calyx-tube broadly obconical; limb 5-lobed; lobes triangular-ovate, acute, spreading, keeled inside. Petals 5, rarely 0, hood-shaped, incurved. Disk flat, pentagonal, often with 10 depressions; margin free. Stamens 5, included in the petals or exceeding them; filaments subulate; anthers 2-celled, opening longitudinally. Ovary immersed in the disk and adnate to its base, 2-, rarely 3- or 4-celled. Styles 2, diverging or combined; stigmas papillose. Drupe fleshy, globose or oblong; putamen woody or horny, 1—3-celled, 1—3-seeded. Seeds plano-convex; testa thin, brittle, smooth and shining; albumen 0 or very little. Cotyledons thick; radicle short. — Shrubs or trees, often decumbent or creeping and furnished with sharp, curved or straight spines. Leaves alternate, petiolate, 3—5-nerved from the base, entire or crenate, coriaceous. Stipules either 1 or rarely both spinescent, deciduous. Flowers small, greenish, in small, axillary cymes. Fruit often edible.

A genus of about 50 species, scattered over the tropics and subtropics, chiefly in Asia and America, a few extending to the Pacific Islands and Australia.

- A. Leaves glabrous above, beneath as well as the young branches with a dense ferrugineous or grey tomentum, very rarely almost glabrous. Disk with 10 more or less distinct cavities. 1. **Z. jujuba**.
- B. Leaves pale, glaucous-green glabrous, except when quite young. Branches drooping, glabrous; bark white, shining. Disk with a fringe of hairs around the base of the style. 2. **Z. Spina Christi**.

888. (1.) **Zizyphus jujuba** Lam. Encycl. III (1789), p. 316. — Boiss. Flor. Or. II, p. 12. — Sickenberg. Contrib. Flor. d'Eg., p. 208. — A tall shrub or small tree, with short stipular prickles, occasionally wanting. Leaves ovate or nearly orbicular, usually very obtuse, 2—6 cm long, entire or toothed, 3-nerved, glabrous above, covered underneath, as well as the petioles and branches, with a close white or rusty tomentum. Cymes small, compact, and nearly sessile. Ovary 2-celled, tapering into a short 2-lobed style. Drupe globular, usually about 1 to nearly 2 cm diameter, 2-celled or 1-celled by abortion. — Flow. March.

M. ma. Alexandria, rarely cultivated in gardens; Ramle, naturalized. — **N. d.** Island of Roda.

Local name: 'ennâb.

Common in India, where the fruit is prepared into pectoral lozenges called „Pate de Jujube“.

889. (2.) **Zizyphus Spina-Christi** Willd. Spec. Plant. I (1797), p. 1105. — Boiss. Flor. Or. II, p. 13. — DC. Prodrum. II, p. 20. — Aschers.-Schweinf. III. Flor. d'Eg., p. 59 no. 270. — Rhamnus Spina-Christi L. Spec. Plant. I, p. 282. — A tree or shrub with white long flexuose or short intricate branches. Leaves ovate ovate-oblong or lanceolate, obtuse or acute, often mucronate, equal at the base, crenate-serrate, 2—6 cm long, glabrous or slightly pubescent beneath when young especially along the veins; petioles 1—2 cm long; stipular prickles when present short, both or 1 only recurved. Cymes pubescent, few- or many-flowered, sessile or on peduncles from a mm to 2,5 cm or more in length. Flowers large for the genus. Calyx densely pubescent. Disk large, furnished with a fringe of hairs around the base of the styles. Styles united above the middle and then spreading, not recurved. Drupe 2-celled, large, fleshy, spherical. — Flow. March to April.

M. ma. N. d. N. v. O. Dakhel; Great Oasis; Little Oasis; Farâfra; **D. l. D. a. sept. D. a. mer.** Cultivated and naturalized everywhere.

Local name: sidr; generally: nabq.

Also known from other parts of the Mediterranean region and spontaneous in Tropical Africa.

342. (2.) **Rhamnus** Linn.

Flowers hermaphrodite or polygamously dioecious. Calyx-tube urceolate; limb 4—5-lobed; lobes triangular-ovate, erect or spreading, keeled inside. Petals 4, 5 or none, inserted on the margin of the calyx-tube considerably above the ovary. hood-shaped or flat. Stamens 4 or 5; with very short filaments. Disk clothing the calyx-tube, margin thin. Ovary free, ovoid, 3- or 4-celled. Styles 3 or 4; stigmas obtuse, papillose. Drupe baccate, globose or oblong, encircled at the base by the calyx-tube, with 2—4 pyrenes; pyrenes horny or cartilaginous, dehiscing inwardly or indibiscent. Seeds obovate; testa membranous or crustaceous, smooth or furrowed at the back; raphe dorsal, ventral or lateral; albumen fleshy. Cotyledons flat or with recurved margins, thin; radicle short. — Shrubs or trees. Leaves alternate or subopposite, petiolate, deciduous or evergreen, penninerved, entire or dentate. Stipules small, deciduous. Flowers axillary, racemose or cymose.

A genus of about 50 species, chiefly from the temperate and warmer parts of Europe, Asia, and America, rarer in the tropics.

890. **Rhamnus disperma** Ehrenberg ex Boiss. Flor. Or. Supplem. (1888) p. 156. — *Rhamnus palaestina* Aschers. and Schweinf. in Aschers.-Schweinf. Ill. Flor. d'Eg., p. 60 no. 271 not Boiss. Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 753. — A tall shrub or small tree. branches tortuous; bark cinerascens; branches alternate, often ending into a spine. Leaves small, oblong-spathulate obtuse, petioled; glabrous, entire, minutely pellucid-punctate; flowers fascicled, as long as the pedicels or somewhat shorter. — Flow. April.

D. a. sept. Galâla.

Local name: za'rûr; 'ern (Schweinfurth).

Also known from Sinai.

60. **Vitaceae.**

Flowers regular, hermaphrodite or unisexual. Calyx small, entire or 4 or 5-toothed. Petals 4 or 5, free or cohering, valvate in the bud. Stamens 4 or 5, opposite the petals, inserted on the outside of the disk at its base or between its lobes. Disk free or adnate to the ovary. Ovary usually immersed in or surrounded by the disk, more or less perfectly 2—6-celled; style short and conical or subulate, or none; stigma small, capitate or lobed. Ovules 2 in each cell where there are 2 cells, solitary where there are more cells, erect, anatropous, with a ventral raphe. Fruit a berry, the dissepiments frequently disappearing. Seeds 1—6; testa hard, the

inner coating frequently penetrating into the fissures of the ruminant albumen. Embryo short, in the base of the albumen; cotyledons oval; radicle short, inferior. — Woody climbers or rarely erect shrubs or small trees. Branches often articulate. Leaves alternate or the lower ones opposite, simple or compound, the petiole usually articulate with the stem and expanded into a membranous stipule. Flowers small, in little umbels, cymes, racemes, or spikes, arranged in leaf-opposed, cymose, thyrsoid, or elongated panicles.

The Order, almost or quite limited to the two following genera, is widely dispersed over the tropical and warm regions of the globe, more abundant in the Old World than in America, and the smaller genus confined to the Old World.

- A. Flowers 4-merous 1. *Cissus*.
 B. Flowers 5-merous 2. *Vitis*.

343. (1.) *Cissus* Linn.

(Climbing vines, with fleshy tissues and strong tendrils. Leaves alternate; blades simple or 3-foliolate or at least 3-parted, the segments or leaflets entire or toothed, deciduous. Flowers perfect or sometimes polygamous, in small cymes. Floral envelopes mostly in fourth's. Petals distinct, expanding during the anthesis. Disk cup-like, 4-lobed. Stamens often 4, inserted on the margin of the disk. Ovary 2-celled, adnate to the base of the disk; style subulate. Ovules 2 in each cavity. Berries rather small, inedible, with scant pulps. Seeds more or less 3-angled.

A large genus in the Tropics of both hemispheres.

891. *Cissus ibuensis* Hook. fil. Flor. Nigrit. (1849). p. 265. — *Vitis ibuensis* Baker in Oliv. Flor. Trop. Afr. I, p. 402. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 752. — Gilg and Brand, Vitaceae africanae in Engler's Bot. Jahrb. XLVI (1912), p. 486. — Stems slender but firm, very wide-climbing, angular, deeply striated, tomentose when young, becoming glabrous when mature. Petioles 1—2 cm long, slender but firm, pubescent. Tendrils copious, firm. Leaves with 3 leaflets, the terminal one ovate or oblong, 4—6 cm long, about 2 cm broad, the apex pointed, the edge furnished with shallow but sharp distant teeth, the base rounded, the petiolule 1—3 cm long, the lateral ones similar, spreading, not imbricated, texture membranous, both sides covered with fine grey tomentum when young, becoming glabrous when mature. Flowers in copiously compound cymes, 2½—4 cm broad. Peduncles 8—12 cm long, firm, slender, erect, pubescent. Pedicels 2.5 mm long, pubescent. Calyx cyathiform, pubescent, not lobed, 1—2 mm broad. Corolla subglobose, greenish.

Petals and stamens 4. Disk conspicuous, nearly 2—2,5 mm broad, reddish. Style very short. Berries round, glabrous, green, reaching 1—1,5 cm each way. — Flow. March.

N. v. Islands near the cataracts.

Local name: 'aneb-ed-dib.

Also known from Tropical West and East Africa.

344. (2.) **Vitis** Linn.

Petals free or cohering at the tips, and falling off together. Stamens inserted round the base of the short, annular, or lobed disk. Ovary 2-celled (sometimes imperfectly so), with 2 ovules in each cell. — Woody climbers or rarely bushy shrubs, with leaf-opposed tendrils (abortive inflorescences). Leaves simple or compound, sometimes marked with pellucid dots. Panicles in the Egyptian species cymose or rarely reduced to solitary umbels. Petals very concave, almost hood-shaped, but without the dorsal appendages of some Asiatic species.

A small genus, extending over the whole world.

392. **Vitis vinifera** L. Spec. Plant. I. (1753), p. 1013. — Boiss. Flor. Or. I., p. 955. — DC. Prodrum. I., p. 633. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 59. — Sickenberg. Contrib. Flor. d'Eg., p. 208. — Stem wide-climbing, firm, naked. Leaves rotundate-cordate in general outline, deeply 5-lobed, irregularly and deeply, often doubly toothed, texture membranous, upper surface glabrous, lower often slightly matted with white cottony down. Flowers in copious thyrsoid panicles; pedicels 3 mm long, slender. Calyx under 1 cm across, not lobed. Unexpanded corolla oblong, 2 mm long. Petals 5. Stamens 5. Ovary flask-shaped, the stigma sessile. — Flow. March to April.

N. d. N. f. N. v. O. Cultivated in gardens, not abundantly.

Local name: 'aneb; Zebib.

Also known from all parts of the Mediterranean region.

Malvales.

Herbs, shrubs or trees. Leaves various: blades simple commonly lobed. Flowers often showy, commonly involucrate. Calyx of distinct or partially united valvate sepals. Corolla of distinct petals. Androecium of numerous stamens with monadelphous filaments or these collected into several sets, or few. Gynoecium of several united or distinct carpels. Ovaries with axile placentae. Mature carpels sometimes separating from each other.

61. Tiliaceae.

Flowers regular, hermaphrodite or rarely unisexual. Sepals 5, rarely 3 or 4, free or more or less cohering, usually valvate. Petals as many or fewer or none, alternate with the sepals, inserted round the base of the torus. Stamens indefinite, rarely reduced to very few, inserted on the torus, which is often raised or disk-like. Filaments free or slightly united at the base. Anthers 2-celled, with parallel or rarely divaricate cells, opening in longitudinal slits or in terminal pores. Ovary free, sessile, 2 or more celled. Style simple and entire, or divided at the top into as many stigmatic teeth or lobes as there are cells. Ovules 1, 2, or more in each cell, erect, pendulous, or horizontal. Fruit capsular or indehiscent, with single or several-seeded cells, where several-seeded the cells often subdivided by spurious vertical or transverse partitions. Seeds without any arillus, the testa usually coriaceous or crustaceous. Albumen fleshy, rarely deficient. Embryo straight or rarely curved or slightly folded. Cotyledons leafy or rarely fleshy; the radicle next to the hilum, usually shorter than the cotyledons. — Trees, shrubs, or rarely herbs. Leaves alternate or very rarely opposite, simple, with pinnate or palmate nerves, entire, toothed, or rarely lobed. Stipules usually free and small or deciduous. Flowers axillary, terminal or leaf-opposed, usually in little cymes, often almost umbellate, either solitary and sessile or pedunculate, or arranged in panicles.

A large Order, chiefly tropical or subtropical, spread over both the New and the Old World, with one extratropical genus (*Tilia*) in the northern and an other one (*Aristotelia*) in the southern hemisphere.

345. *Corchorus* Linn.

Sepals 5, rarely 4. Petals as many, without any cavity at the base. Stamens indefinite, rarely few, inserted on a torus scarcely raised, but occasionally expanded in a disk round their base; anther-cells opening longitudinally. Ovary 2—5-celled, with several ovules in each cell; style short, simple. Capsule either long without prickles, or short or globular and more or less warted, muricate or echinate, opening loculicidally in 2—5 valves, with several seeds in each cell, rarely separated by transverse partitions. Seeds pendulous or horizontal, albuminous; embryo usually curved, with leafy cotyledons. — Herbs, undershrubs, or shrubs, with simple or stellate hairs. Leaves serrate. Peduncles very short, lateral or leaf-opposed, bearing 1 or several flowers. Bracts small. Flowers usually small, yellow.

A considerable genus, of which a few species appear to be limited to tropical America or to Australia, the remainder generally dispersed over various tropical regions in the Old as well as the New World. The fruit in this genus is often indispensable for determining the species.

A. Sepals and Petals 5. Stamens numerous.

I. Asperulous; leaves ovate to ovate-oblong . . 1. *C. trilocularis*.

II. Glabrous; leaves oblong-lanceolate.

a) Siliques 6—8 times as long as broad . . 2. *C. olitorius*.

b) Siliques 20—30 times as long as broad . . 3. *C. tridens*.

B. Sepals and petals 4. Stamina 8. 4. *C. antichorus*.

893. (1.) **Corchorus trilocularis** Linn. Mant. (1764), p. 67. — Boiss. Flor. Or. I, p. 845. — Jacq. Hort. Vind., tab. 173. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 53 no. 216. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 751. — Sickenberg. Contrib. Flor. d'Eg., p. 198. — DC. Prodrum. I, p. 504. — *Corchorus fruticosus* Visiani ex Walp. Rep. Bot. I, p. 354. — *Corchorus serraefolius* DC. Prodrum. I, p. 504. — *Corchorus triflorus* Bojer ex Walp. Rep. Bot. V, p. 117. — Annual or perhaps perennial, with numerous erect or decumbent purplish, smooth or pilose, branching stems. Leaves elliptic, oblong or oblong-ovate, 2—6 cm long, 1—2 cm wide, crenate-serrate, either with or without basal lobes. Petioles very short, pilose. Stipules setaceous. Pedicels 2—3-flowered. Petals spathulate, bright yellow. Pods 4—6 cm long, erect, straight or curved, slender, 3—4-angled, 3—4-valved; valves scabrous, deeply pitted on the inner surface, and ending in a short straight point. Seeds numerous. — Flow. February to March.

N. v. mer. Kene; islands near Aswân. — **O.** Siwa; Farâfra; Dakhel; Great Oasis.

Local name: melukhiye.

Cultivated everywhere in the Tropics; Indian origin?

894. (2.) **Corchorus olitorius** L. Spec. Plant. I (1753), p. 746. — Boiss. Flor. Or. I, p. 845. — Lam. Ill., tab. 478 fig. 1. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 53 no. 217. — DC. Prodrum. I, p. 405. — *Corchorus longicarpus* Don. Gen. Syst. I, p. 543. — *Corchorus lanceolatus* Don. Gen. Syst. I, p. 543. — Annual or suffrutescent, with erect, branching, nearly glabrous stem. Leafstalks 2—5 cm long, pilose. Stipules setaceous, half the length of the petioles. Leaves 4—8 cm long, 2—4 cm wide, ovate-lanceolate, 3—5-nerved, smooth, serrate; the two lowermost serratures prolonged into long, setaceous appendages. Pedicels 2—3-flowered, erect, shorter than the petioles. Sepals sharply pointed, shorter than the spathulate yellow petals. Pod cylindrical, appressed, straight or slightly curved,

2—6 cm long, 10-ribbed, 5-valved, each valve ending in a long point, the whole forming a long, straight, undivided beak to the fruit; inner surface of the valves transversely septate and pitted to receive the numerous blackish seeds. — Flow. February to April.

M. ma. M. p. N. d. N. f. N. v. O. D. a. sept. D. a. mer. Cultivated everywhere for its fibre; often subspontaneous.

Local name: melukhiye.

Wild, or cultivated as a potherb in every part of Northern and Tropical Africa, and also widely diffused throughout the tropics, extending even into Australia. It varies considerably in stature, form of leaf, hairiness, etc. The valuable fibre, known as Jute, is derived from this and allied species.

var. **incisifolius** Ascherson and Schweinfurth in Aschers.-Schweinf. Ill. Flor. d'Eg. (1887), p. 53 no. 217. — Sickenberg. Contrib. Flor. d'Eg., p. 198. — Leaves shorter than in the type, serrate-incised. — Flow. March.

N. d. Damietta, in cotton-flds.

Local name: melukhiye.

Only known from Egypt.

895. (3.) **Corchorus tridens** L. Mant. (1764), p. 566. — Boiss. Flor. Or. I, p. 845. — Pluken, tab. 127 fig. 4. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 53 no. 218. — Sickenberg. Contrib. Flor. d'Eg., p. 198. — DC. Prodrum. I, p. 505. — *Corchorus angustifolius* Schum. and Thonn. Plant. Guin., p. 244. — An annual with an erect or prostrate, pilose or smooth, branching stem. Leafstalks 1—2 cm long, pilose. Stipules setaceous. Leaves 2—6 cm long, 2 cm wide, oblong-acuminate or linear, serrate, with or without basal appendages. Peduncles 1—3-flowered. Pods erect, slender, straight or curved, cylindrical, smooth or striated, 2—5 cm long, 2—3-valved; valves scarcely pitted on the inner surface and terminating in a horizontal point, so that the fruit is terminated by 3 short spreading horns. — Flow. January to March.

N. v. mer. Island of Philae near Aswân; island of Ssalig.

Local name: melukhiye.

A variable plant in habit and foliage, widely distributed in the Tropics.

896. (4.) **Corchorus antichorus** Rauschel Nomencl. Bot. ed. III (1856), p. 158. — Boiss. Flor. Or. I, p. 846. — *Antichorus depressus* L. Mant., p. 64. — *Fussicaca edulis* Forsk. Flor. aeg.-arab., p. 210. — *Corchorus microphyllus* Fresen. Mus. Senck. II, p. 156. — A woody perennial with a thick woody stock, from whose summit radiate thick, tortuous, intricately divided, prostrate branches, 16—27 cm

long. Leaves small, 5—10 cm long, shortly petiolate, roundish, plicate-crenate, serrate, palmately 3-nerved, slightly tomentose. Flowers solitary or in pairs, on short stout pedicels. Capsules long (2—2½ cm), slender, siliquiform, straight or flexed, beaked at the apex, 4-valved. — Flow. February to March.

D. a. mer. Derawa; Wady Abû-Agâq near Aswân.

Local name: melukhiye.

Also known from Tropical Africa.

62. Malvaceae.

Flowers regular, usually hermaphrodite or rarely partially dioecious or polygamous. Sepals 5, rarely 3 or 4, more or less united in a lobed or entire calyx, the lobes valvate or very rarely slightly imbricate. Petals 5, hypogynous, usually adnate at the base to the staminal column, contorted in the bud, rarely wanting. Stamens indefinite, hypogynous, more or less united at the base, the column divided into filaments at the top or bearing the filaments outside, below or up to the top. Anthers from globose to linear, often reniform or variously waved, 1-celled or spuriously divided into two cells by a thin and incomplete longitudinal septum. Torus small or conical and protruding into the centre of the ovary, not expanded into a disk. Ovary 2 or more-celled (very rarely reduced to a single carpel), entire or lobed, the carpels verticillate round the axis or (in genera not Egyptian) irregularly clustered. Style simple at the base, divided at the top into as many or twice as many branches or stigmas as there are cells, or rarely entire and clavate. Ovules 1 or more in each cell, ascending or horizontal, with a ventral or superior raphe, or reversed and pendulous, with the raphe dorsal. Fruit dry or rarely baccate, the carpels separating and indehiscent or 2-valved, or united in a loculicidally dehiscent capsule. Seeds with the testa usually crustaceous, without or with very little albumen; cotyledons usually folded and often enclosing the curved or rarely straight radicle. — Herbs, shrubs, or soft-wooded trees, the hairs usually stellate. Leaves alternate, mostly toothed, lobed or divided, with palmate nerves or divisions, rarely digitately compound. Stipules free, usually subulate or small and deciduous, rarely leafy. Peduncles usually 1-flowered and articulate above the middle, rarely bearing a bract at the joint or several-flowered, all axillary or the upper ones forming a terminal raceme or panicle. Bracteoles either none or 3 or more, free or united, forming an involucre close to or adherent to the calyx. Flowers often large, usually purple, red, or yellow.

A large Order generally dispersed over all except the coldest regions of the globe, distinguished from Sterculiaceae and Tiliaceae by the 1-celled anthers, and from all others by the valvate calyx.

A. Staminal column bearing stalked anthers at the top.

I. Epicalyx present.

a) Epicalyx-bracts free 1. **Malva**.

b) Epicalyx-bracts connate.

1. Bracteoles 6—9 2. **Althaea**.

2. Bracteoles 3 3. **Lavatera**.

II. Epicalyx 0.

a) Ovule 1 4. **Sida**.

b) Ovule many 5. **Abutilon**.

B. Staminal column merely toothed as the top.

I. Style-branches distinct 6. **Hibiscus**.

II. Style-branches united 7. **Gossypium**

346. (1.) **Malva** Linn.

Bracteoles 3, distinct. Sepals 5, connate at the base. Petals emarginate connate at the extreme base. Staminal-tube antheriferous to the top, without sterile teeth. Ovary many-celled; styles as many as the carpels, stigmas linear; ovules 1 in each cell. Ripe carpels 1-seeded, indehiscent, separating from a short conical torus. Seeds ascending. — Downy herbs. Leaves lobed. Flowers in axillary tufts.

The species of this genus are only found in the temperate regions of the Old World.

A. Axillary peduncles solitary 1. **M. aegyptia**.

B. Axillary peduncles aggregate.

I. Flowers 2—3 cm broad 2. **M. silvestris**.

II. Flowers 5—6 mm broad.

a) Claw of the petals barbate 3. **M. nicaeensis**.

b) Claw of the petals glabrous 4. **M. parviflora**.

897. (1.) **Malva aegyptia** L. Spec. Plant. I (1753), p. 981. — Boiss. Flor. Or. I, p. 818. — Cav. Dissert. II, tab. 17 fig. 1. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 51 no. 200. — Sickenberg. Contrib. Flor. d'Eg., p. 191. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 750. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 599 no. 54. — Aschers. Flor. Rhinocol., p. 792 no. 58. — An annual plant, 5—10 cm high, sometimes somewhat more appressed pubescent. Leaves orbicular, bipalmatipartite into short, oblong, ciliate lobes. Peduncles somewhat longer than the leaf; bractlets 2, linear; calyx-lobes triangular, acuminate, longer than the bractlets, about as long as corolla. — Flow. December to March.

M. ma. Marmarica: Matruqa; Ras-el-Kena'is; Mariut; Alexandria-West and -East; Abukir. — **M. p.** El-Arish; Henwah.

Local name: raqmeyh.

Also known from Algeria, Tunisia, Spain, Arabia, Palestine, Syria, Mesopotamia and Persia.

898. (2.) **Malva silvestris** L. Spec. Plant. I (1753), p. 969. — Boiss. Flor. Or. I, p. 819. — Rehbch. Ic. V, fig. 4840. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 51 u. 201. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 751. — Sickenberg. Contrib. Flor. d'Eg., p. 191. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 599 no. 55. — A biennial, with several erect or ascending stems. 30—60 even to 90 cm high, more or less clothed with spreading hairs, especially in the upper part. Leaves on long stalks, orbicular, slightly cordate at the base, with 5 or 7 lobes, broad and short, but always deeper than in *M. parviflora*, and the middle one often longer than the others. Flowers in axillary clusters, usually of a reddish-purple; the petals about 15—20 mm long. Carpels usually 10, flat on the back, with angular edges, so that the fruit has rather projecting ribs than furrows between the carpels. — Flow. January to March.

M. ma. Marmarica: Matruqa; Mariut; Montaza: Alexandria-West and -East. — **N. d.** Alexandria; Damanhur; Tanta; Qalyûb; Shubra near Cairo.

Local name: khobbeyze frengiye (Ascherson).

Common in the other parts of the Mediterranean region and in Europe.

var. **ambigua** Aschers. and Schweinfurth in Primit. Flor. Marmaric. (1893), p. 599 no. 55. — *Malva ambigua* Guss. Prodrum II, p. 321.

M. ma. Marmarica: Matruqa; Mariut.

Also known from the other parts of the Mediterranean region.

899. (3.) **Malva nicaeensis** All. Flor. Pedem. II (1785), p. 40. — Boiss. Flor. Or. I, p. 819. — Rehbch. Ic. V fig. 4838. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 751 no. 1274. — Sickenberg. Contrib. Flor. d'Eg., p. 191. — An annual plant, 30—60 cm high, sometimes somewhat more, erect or diffuse, more or less hairy. Peduncles erect after flowering; bractlets oblong, calyx-lobes triangular, growing after flowering. — Flow. February to March.

M. ma. Alexandria. — **N. d.** Menzale (Ascherson).

Local name: raqmeh (Ascherson).

Also known from all the other parts of the Mediterranean region.

900. (4.) **Malva parviflora** L. Spec. Plant. I (1753), p. 969. — Boiss. Flor. Or. I, p. 820. — Rehbch. V, fig. 4833. — Aschers.-

Schweinf. Ill. Flor. d'Eg., p. 51 no. 202. — Sickenberg. Contrib. Flor. d'Eg., p. 191. — Aschers. Flor. Rhinocol., p. 792 no. 59. — Aschers.-Schweinf. Primit. Flor. Marmar., p. 599 no. 56. — An annual plant with slightly hairy or nearly glabrous trailing stems. Leafstalks 6—8 cm long, with a few simple hairs near the top. Leaves cordate, orbicular, palmately nerved slightly 3—5-lobed, crenate-dentate. Flowerstalks axillary, spreading, much shorter than the leaves. Bracts linear. Sepals ovate or roundish, mucronate, spreading, accrescent. Carpels hairy or smooth, transversely netted, rugose. — Flow. March to April.

M. ma. M. p. N. d. N. f. N. o. O. D. l. D. a. sept. D. a. mer. R.
Everywhere spontaneous. cultivated and subsponaneous.

Local name: Khobbeyze — esh-sheytdniyeh (Delile); generally: Khobbeyzeh.

Also known from the whole Mediterranean region, Persia, Affghanistan, and also in Central Arabia.

347. (2.) **Althaea** Linn.

Bractlets 6-9, connate at the base. Calyx 5-fid. Branches of the style filiform, stigmatose along their inner face. Carpels whorled around a torus shorter than they, flattened at the back, indehiscent, not divided by a partition from the pericarps — Annual or perennial herbs.

A small genus, chiefly from the Mediterranean region and western Asia, with one or two South African species.

A. Annuals 1. **A. Ludwigii.**

B. Perennials.

I. Margins of the carpels not winged.

a) Stemless herbs; leaves reniform 2. **A. acaulis.**

b) Herbs with elongate stems; leaves orbiculate 3. **A. striata.**

II. Margins of the carpels membranous alate 4. **A. ficifolia.**

901. (1.) **Althaea Ludwigii** L. Mant. (1764), p. 98. — Boiss. Flor. Or. I, p. 824. — Cavan. Diss. Ic. tab. 423. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 51 no. 204. — Sickenberg. Contrib. Flor. d'Eg., p. 191. — An annual plant. Hirsute with clustered hairs; stems prostrate. Leaves glabrescent, round, the lower crenate, the others 3—5-lobed or parted into wedge-shaped segments, obtusely dentate at the apex. Pedicels very short, crowded; involucre-lobes linear-setaceous; calyx-lobes lanceolate; petals white somewhat longer than the calyx; carpels glabrous. — Flow. March to April.

M. ma. N. d. N. f. N. o. O. D. i. D. a. sept. Not common on alluvial soil.

Also known from Arabia Petraea and Syria.

902. (2.) **Althaea acaulis** Cavan. Dissert. II (1793), tab. 27 fig. 3. — DC. Prodröm. I, p. 437. — *Alcea acaulis* Alef. Oest. Bot. Woch. (1862), p. 247. — An perennial herb, 20—50 cm high, sometimes more, grey-woolly, stemless or caulescent, flowering from the base. Leaves long petioled, kidney-shaped, crenate, sometimes obtusely 5-lobed. Flowers sessile or short-peduncled, usually crowded; involucre one-third as long as the calyx; petals purple pink or white, retuse, 3—4 cm long; carpels glabrous, transversely wrinkled-pitted. — Flow. March to April.

Without precise locality Figari in Herb. Monsp.

Also known from Arabia and Syria.

903. (3.) **Althaea striata** DC. Prodröm. I (1824), p. 437. — *Alcea striata* Alef. Oest. Bot. Woch. (1862), p. 247. — Sickenberg. Contrib. Flor. d'Eg., p. 191. — Boiss. Flor. Or. I, p. 829. — Perennial, 1 m high or sometimes more, tomentellous. Leaves round-heart-shaped, with 3—5 obsolescent, crenate lobes. Peduncles shorter than the calyx; raceme loose, nearly leafless; involucre one-third as long as the calyx; calyx-lobes lanceolate; petals obcordate, pale pink; carpels glabrous, wrinkled, hairy to the middle line of the flattish back. — Flow. February to March.

D. a. sept. Wady-el-Hagg (Deflers.).

Also known from Arabia Petraea and Palestine.

904. (4.) **Althaea ficifolia** Cavan. Diss. II (1793), tab. 28 fig. 2. — *Alcea ficifolia* L. Hort. Clifort., p. 348. — Boiss. Flor. Or. I, p. 833. — Cav. Dissert. II, tab. 28 fig. 2. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 52 no. 206. — *Alcea aegyptiaca* Boiss. Diagnos. Plant. Or., Ser. II fasc. I p. 103. — *Alcea lavateraeflora* var. *glabrescens* Boiss. Flor. Or. I, p. 829. — A perennial herb, 80—150 cm high, sometimes more, woolly; stem erect, simple. Leaves long-petioled, palmatifid or cut into spatulate to oblong-obovate, obtuse, irregularly crenate-lobulate lobes. Flowers subsessile; involucre a little shorter than the calyx; calyx-lobes triangular-lanceolate; petals obcordate, intensely violet; carpels puberulent, wrinkled on both sides; seeds minutely white-dotted. — Flow. March to April.

N. d. Everywhere cultivated in the old Arabian gardens at Cairo; often naturalized.

Local name: khatmiye.

Also known from Caucasus, Armenia and Persia.

348. (3.) **Lavatera** Linn.

Bracteoles united into a 3-fid involucre. Calyx 5-fid. Branches of the style filiform, stigmatose along their inner face. Carpels whorled around a conical or variously dilated torus, indehiscent. — Herbs, sometimes shrubby at the base, with aspect of *Malva*.

A small genus widely distributed in the Old and New World.

905. **Lavatera cretica** L. Spec. Plant. I (1753), p. 973. — Boiss. Flor. Or. I, p. 822. — Cav. Dissert. II, tab. 32 fig. 1. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 51 no. 203. — Sickenberg. Contrib. Flor. d'Eg., p. 191. — An biennial plant, 50 cm to 1 m high, sometimes somewhat more, scabrous with branching hairs. Leaves round-heart-shaped, obsoletely 5—7-lobed to round, angular-lobed. Peduncles short or 0; lobes of the involucre shorter than the calyx, growing little in fruit, entire, ovate, obtuse; calyx-lobes acute or acuminate; petals violet, notched 2-lobed, 1.5—2 cm long, 3—4 times as long as the calyx. — Flow. March to April.

M. ma. Marmarica: Matruqa; Alexandria-West and -East. — **N. d.** Berimbal near Rosetta; Damietta.

Local name: khobbeyze-nawwar (Ascherson).

Also known from the other parts of the Mediterranean region.

349. (4.) **Sida** Linn.

Bracteoles none, or small and distant from the calyx. Calyx 5-toothed or 5-lobed. Staminal column divided at the top into several filaments. Ovary-cells 5 or more, verticillate, 1-ovulate. Style-branches as many as cells, filiform or slightly clavate, with terminal, capitate or truncate stigmas. Fruit-carpels either obtuse or with connivent points, seceding from the axis, indehiscent or opening shortly at the top in 2 valves. Seeds pendulous or horizontal, with a dorsal raphe. — Herbs or shrubs, usually clothed with a soft or whitish stellate tomentum. Flowers sessile or pedunculate, axillary or in terminal heads, spikes, or racemes, of various colours and sometimes large, but most frequently rather small, yellow, or whitish.

The genus, even as now limited to the exclusion of the *Abutilons*, is large and widely spread over the warmer regions of the globe, but most abundant in America.

906. **Sida spinosa** L. Spec. Plant. I (1753), p. 1203. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 52 no. 207. — Sickenberg. Contrib. Flor. d'Eg., p. 191. — Aschers.-Schweinf. Ill. Flor. d'Eg., Supplem. p. 751. — DC. Prodr. I, p. 460. — *Sida alnifolia* L. Spec. Plant. I, p. 960. — Annual or perennial with long erect or trailing branches covered

with stellate pubescence. Leafstalks nearly as long as the leaves, often provided at the base with a small hooked tubercle. Leaves cordate, oblong-lanceolate or ovate, obtuse, serrate, nearly smooth above, downy beneath. Flowerstalks axillary, solitary or clustered, jointed about the middle, longer than the leafstalks. Calyx cup-shaped, 10-ribbed, 5-cleft; lobes deltoid. Carpels 5, somewhat membranous, slightly reticulate, with 2 short awns, and bursting irregularly toward the base. — Flow. March to April.

N. d. Mansura; Tanta; Zaqaziq; Shubra, Heliopolis; Cairo. — **N. v.** Kene, as a weed in cotton-fields. — **O.** Little Oasis; Farâfra; Dakhel; Great Oasis.

Local name: melukhîyet iblis (Ascherson); 'aqûl.

The species is not uncommon in tropical Asia, more rare in America. It derives its name from the stipules in falling off often leaving a prominent tubercular base, more distinct in this than in any other species, although the character is even here not constant.

350. (5.) *Abutilon* Linn.

Bracteoles none. Calyx 5-lobed. Staminal column divided at the top into several filaments. Ovary-cells 5 or more, verticillate, each with 3 or more, rarely 2, ovules. Style-branches as many as cells, filiform or club-shaped, with terminal stigmas. Fruit-carpels united at the base or entirely seceding, rounded or angular or with diverging points (not connivent) at the top, opening in 2 valves, without internal appendages. Seeds nearly reniform, the upper ones usually ascending, the lower ones pendulous or horizontal. — Herbs or shrubs, rarely trees, usually clothed with a soft stellate tomentum. Leaves usually cordate, angular or lobed, rarely narrow; petioles usually long. Stipules subulate and deciduous. Flowers axillary, yellow or rarely white, the pedicels articulate above the middle or near the top.

A large genus, distributed over the tropical and warm regions of the globe, chiefly American. The genus has frequently been united with *Sida*, but the characters derived from the diverging carpels with more than 1 ovule in each, as contrasted with the converging uniovulate carpels of *Sida*, are too constant and convenient to be neglected in groups so very numerous in species.

A. Ripe carpels rounded or reniform at the top.

I. Branches (especially the upper ones) angular 1. *A. angulatum*.

II. Branches usually terete 2. *A. graveolens*.

B. Ripe carpels truncate, with short prolonged

points 3. *A. bidentatum*.

C. Ripe carpels not seceding from the axis, truncate, acute, but without prolonged point.

I. Fruticous plants.

a) Petals twice as long as the calyx . . . 4. *A. denticulatum*.

b) Petals as long as the calyx 5. *A. Avicennae*.

II. Herbaceous plants 6. *A. muticum*.

907. (1.) **Abutilon angulatum** (Guill. and Perr.) Masters in Oliv. Flor. Trop. Afr. I (1868), p. 183. — Sickenberg. Contrib. Flor. d'Eg., p. 191. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 52 no. 212. — *Bastardia angulata* Guill. and Perr. Flor. Seneg., p. 65. — *Abutilon intermedium* Hochst. in Schimp. Plant. Abyss., no. 1365. — A tall perennial with angular branches, covered with whitish down. Leafstalks longer than the leaves, which are roundish, cordate, acute or acuminate, slightly serrated, 5—7-nerved, paler on the lower than on the upper surface. Stipules subfalcate, reflexed. Panicle terminal, loose, much branched, ultimately leafless. Peduncles jointed, shorter than the petioles. Calyx cup-shaped, 5-cleft; segments ovate, acute, submucronate, much shorter than the yellowish corolla. Fruit subglobose, depressed, umbilicate, twice the length of the persistent calyx. Carpels about 20, submembranous, obtuse, reniform, 1-seeded. — Flow. March to April.

N. d. Naturalized at Shubra near Cairo.

Also known from Tropical Africa.

908. (2.) **Abutilon graveolens** Wight and Arnott Prodrum. Flor. Ind. I (1841), p. 56. — Boiss. Flor. Or., Supplem. p. 135. — Sickenberg. Contrib. Flor. d'Eg., p. 191. — *Sida graveolens* DC. Prodrum. I, p. 473. — *Abutilon tortuosum* Guill. and Perr. Flor. Seneg. I, p. 68. — *Abutilon Figarianum* Webb Fragment. Flor. Aethiop., p. 53. — A tall perennial covered with down, interspersed among which are a few spreading villi. Leafstalks as long as the leaves, the latter orbicular-cordate, acuminate, coarsely dentate, 7—12-nerved. Pedicels solitary, axillary, jointed, shorter than the leafstalks. Calyx cup-shaped, 5-fid, its 5 segments oval, cuspidate, shorter than the yellow corolla, but about equalling the ripe fruit, which latter is subglobose and consists of 20 carpels ultimately seceding from the axis. Carpels membranous, oblong, somewhat rounded at the apex, shortly beaked or muticous. Seeds reniform, 3 in each carpel. — Flow. March to May.

N. v. Kalabshe (Sickenberger).

Also known from Tropical Africa and India.

909. (3.) **Abutilon bidentatum** Hochst. in Rich. Flor. Abyss. I (1847), p. 68. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 52 no. 209. —

An erect undershrub with slender downy branches. Leaves on short stalks, cordate-ovate, acute, scarcely acuminate, minutely toothed, slightly pilose and villose on both surfaces. Flowers in small axillary panicles. Peduncles longer than the petioles, jointed above. Calyx 5-fid; segments deltoid, acuminate, shorter than the ripe fruit, which latter is subglobose, truncate, depressed. Carpels 16—20, 3-seeded, compressed, truncate at the apex and 2-dentate, one tooth directed outwards, the other towards the centre of the flower. — Flow. February to March.

N. v. Siut; Kene; Luksor; Esne; Aswân, scarcely. — **O.** Little Oasis; Great Oasis. — **D. a. sept.** Desert near Kom Ombo.

Local name: qerqeydân.

Also known from Tropical Africa and Arabia.

910. (4.) **Abutilon denticulatum** Fres. in Mus. Senckenb. I (1835), p. 182. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 52 no. 208. — Sickenberg. Contrib. Flor. d'Eg., p. 191. — *Abutilon albidum* Webb and Berthel. Phyt. Canar. III, p. 39 tab. 2. — *Abutilon fruticosum* Guill. and Perr. Flor. Seneg. I, p. 73. — *Abutilon microphyllum* A. Rich. Flor. Abyss. I, p. 70 tab. XV. — *Abutilon denticulatum* R. Br. in Salt. Abyss. App., p. 65. — A much branched rigid perennial or undershrub, densely covered with fine white down. Leaves small, on short stalks, cordate-ovate, acute, denticulate, covered with soft whitish down on both surfaces; stipules linear. Peduncles solitary, axillary, longer than the petiole, 1—3-flowered, jointed. Calyx half the length of the corolla; calyx-lobes ovate, acute. Fruit cylindrical, truncate, about 1 cm long, scarcely shorter than the calyx. Carpels 10, persistent, each one oblong, truncate, with no beak, splitting down the back. Seeds 2—3 in each carpel, tuberculate. — Flow. January to March.

D. a. mer. Kene; Luksor, scarcely.

Local name: qerqeydân.

Also known from the Canaries, as well as from Arabia, Tropical Africa, Aden, Palestine and Scinde. — The plant varies in size of its leaves.

911. (5.) **Abutilon Avicennae** Gaertn. Carp. II (1791), p. 251. — Boiss. Flor. Or. I, p. 856. — Rehbch. Ic. V, fig. 4832. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 52 no. 210. — Sickenberg. Contrib. Flor. d'Eg., p. 191. — Sida *Abutilon* L. Spec. Plant. I, p. 963. — An annual covered for the most part with fine down, intermingled with which are a few villi. Leaves on very long hispid stalks, orbicular, cordate, acuminate, dentate, downy on both surfaces, villous or hispid along the nerves. Stipules large, oblique, broadly ovate-lanceolate. Inflorescence a terminal, ultimately leafless, panicle; pedicels short,

jointed below the middle. Calyx hispid, deeply 5-parted; segments ovate-lanceolate. Ripe fruit cylindrical, truncate, umbilicate, longer than the persistent calyx. Carpels 20, not seceding, oblong, subrostrate, blackish, membranous, dehiscing along the dorsal suture, each 3-seeded. Seeds covered with tufts of stellate hairs. — Flow. February to April.

N. d. Marsale, in cotton-fields; Mansura; Sharabas; Qirmis; Abu Za'bel.

Local name: shôk ghennêm.

Also known from the other parts of the Mediterranean region and South Eastern Europe.

912. (6.) **Abutilon muticum** (Del.) Webb Fragm. Flor. Aethiop. (1853), p. 51. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 52 no. 211. — Sickenberg. Contrib. Flor. d'Eg., p. 191. — *Sida mutica* Delile Illustr. Flor. d'Eg., p. 60 no. 45. — *Abutilon glaucum* Webb in Hook. Flor. Nigrit., p. 109. — *Abutilon asiaticum* Guill. and Perr. Flor. Seneg. I, p. 67 not Linn. — *Sida glauca* Cav. Ic. I, p. 8 tab. 11. — *Sida pannosa* R. Br. in Salt Abyss. App., p. 65 not Forsk. — *Abutilon pannosum* Webb Fragm. Flor. Aeth., p. 51. — A tall perennial or undershrub with cylindrical, downy branches. Leafstalks about as long as the leaves, which latter are roundish or slightly angular, cordate, acuminate, irregularly dentate, 7—9-nerved, downy on both surfaces. Panicles axillary and terminal. Floral leaves deciduous. Peduncles jointed, scarcely as long as the petioles. Calyx cup-shaped, its 5 segments ovate, cuspidate, sometimes deltoid and acuminate, shorter than the corolla. Petals pinkish with a deeper coloured spot at the base. Fruit subglobose, depressed at the top, very downy, exceeding the persistent calyx. Carpels 20 or more, ultimately seceding, membranous, reniform, beakless, each 2—3-seeded. — Flow. December to March.

N. f. N. v. Everywhere. — **O.** Dakhel; Great Oasis. — **D. a. mer.** Esne.

Local name: qerqeydânîy.

Also known from Tropical Africa, the Cape Verde Islands, Afghanistan and the hotter parts of Asia.

351. (6.) **Hibiscus** Linn.

Bracteoles several, rarely reduced to 5 or fewer, usually narrow, free or more or less united, sometimes very small. Calyx 5-lobed or 5-toothed. Staminal column bearing usually numerous filaments on the outside below the truncate or 5-toothed summit. Ovary 5-celled, with 3 or more ovules in each cell; style-branches 5.

spreading, or rarely erect and subconnate or exceedingly short, with terminal dilated or capitate stigmas. Capsule membranous or coriaceous, loculicidally 5-valved, the endocarp not usually separating, and rarely produced into spurious dissepiments apparently doubling the number of cells. Seeds reniform or nearly globular, glabrous-pubescent or woolly. — Herbs, shrubs, or trees, hispid tomentose or glabrous, the hairs almost always stellate. Leaves various, often deeply divided. Stipules in the Egyptian species subulate or small and deciduous. Flowers usually large, the petals almost always marked with a deeper colour at the base. Filaments usually short and numerous, crowded along the greater part of the elongated staminal column, rarely elongated, fewer and placed close round the top of the short column. Bracteoles usually persistent, but in a few species so deciduous as only to be seen on the very young buds.

A very large genus, widely dispersed over the tropical regions of the globe, a few extending into more temperate climates both in the northern and southern hemispheres.

A. Bracts of the epicalyx distinct, entire 1. **H. Trionum**.

B. Bracts of the epicalyx united at the base or confluent with the epicalyx of 5 bracts.

I. Leaves entire or with shallow lobes 2. **H. Sabdariffa**.

II. Leaves deeply divided 3. **H. cannabinus**.

913. (1.) **Hibiscus Trionum** L. Spec. Plant. I (1753), p. 981. — Boiss. Flor. Or. I, p. 840. — Rehbch. Ic. V, fig. 4860. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 53 no. 213. — Sickenberg. Contrib. Flor. d'Eg., p. 191. — *Hibiscus ternatus* Cav. Diss. II, tab. 64 fig. 3. — *Hibiscus oesicarius* L. Spec. Plant. I, p. 981. — DC. Prodr. I, p. 453. — A much-branched hispid annual, 30—60 cm high. Leaves 4—6 cm long, on long stalks, roundish, generally deeply palmately 3—5-lobed; lobes variable in shape, coarsely and irregularly toothed, hispid, lower leaves undivided. Peduncles solitary, as long as the petioles, jointed near the top. Epicalyx of 7—12 distinct, linear, ciliolate segments. Calyx ventricose, accrescent, 5-cleft; lobes triangular or obtuse with 3 green hispid nerves. Corolla yellow with a purple centre, larger than the calyx. Capsule oblong, obtuse, blackish, ciliated. Seeds smooth. — Flow. March to April.

M. ma. Abusir; Alexandria-West and -East; Mandara; Abukir. — **N. d.** Alexandria; Damietta; Mansura; Sharabas; el-Merg; Matariya; and Shubra near Cairo. — **N. f.** Medinet-el-Fayûm; Abuksa; Senûris; Tamia. — **O.** Great Oasis.

Local name: shebbet; til-shitâmi; aîn-bâggara.

Common throughout Africa and Southern Asia, extending northwards to China and the Amur.

914. (2.) **Hibiscus Sabdariffa** L. Spec. Plant. I (1783), p. 980. — DC. Prodrum. I, p. 483. — Annual or sometimes perennial, with a slightly branched, erect, smooth or slightly hispid, often purplish stem. Leaves stalked; lower ones (and sometimes the upper ones also) undivided, cordate or cuneate at the base, ovate, acute, dentate, palmately 3—5-nerved, with a single gland on the central nerve near the base, smooth or with a few weak hairs on both surfaces; upper leaves generally larger, palmately 3—5-lobed; lobes oblong, lanceolate, the central one longest. Peduncles solitary, axillary, 1-flowered, thickened upwards, much shorter than the leaves. Epicalyx of 8—10. linear-oblong, villous or tuberculate segments, connate below with the base of the calyx. Calyx cupshaped, longer than the epicalyx, often purplish, 5-parted; segments deltoid, acuminate, studded with asperities, especially on the margins. Corolla yellow, much larger than the calyx. Capsule ovoid, pointed, densely villous, shorter than the calyx; valves leathery, pointed. Seeds numerous, reniform, pilose. — Flow. February.

N. v. Luksor, scarcely in gardens and semi-naturalized.

Local name: kerkadêb.

A commonly cultivated plant in tropical countries, and, like most plants so circumstanced, very variable in stature, form of leaves, etc. In the East and West Indies it is used as a cooling and agreeable article of diet.

915. (3.) **Hibiscus cannabinus** L. Spec. Plant. I (1753), p. 981. — Boiss. Flor. Or. I. 840. — DC. Prodrum. I, p. 450. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 52 no. 214. — Sickenberg. Contrib. Flor. d'Eg., p. 191. — *Hibiscus radiatus* Cav. Diss. II, p. 150 tab. 154 fig. 2. — *Hibiscus verrucosus* Guill. and Perr. Flor. Seneg. I, p. 480. — *Hibiscus aculeatus* Don. Gen. Syst. I, p. 480. — An erect, branched annual, more or less thickly beset with aculeate tubercles. Leaves on very long stalks, deeply palmately 5—7-lobed; lobes oblong-lanceolate, sinuous, denticulate, or sometimes more deeply divided, smooth on both surfaces or with a few prickly hairs, 1-glandulose on the under surface. Peduncles axillary, short, thick. Epicalyx of 5—7, linear, slightly coherent segments, shorter than the calyx, whose 5 lobes are lanceolate, acuminate, 1-glandulose, their margins and midribs fringed with coarse purplish bristles. Corolla yellow, with a purple centre, three or four times larger than the calyx. Capsule ovoid, pointed, villous, half the length of the calyx. Seeds numerous, slightly pilose. — Flow. March to April.

N. d. N. v. Cultivated abundantly and often spontaneous.

Local name: til.

The plant is also widely distributed by cultivation through Tropical Africa, India and other parts of Asia, and in Subtropical Australia. — The plant is very variable in the form and dimensions of the leaves, and to a les extent in the colour of the flowers.

352. (7.) *Gossypium* Linn.

Epicalyx of 3 large cordate bractlets. Calyx entire or slightly 5-lobed. Staminal column bearing anthers at the upper part only. Ovary 5-celled; ovules ∞ . Fruit capsular, loculicidally dehiscent. Seeds densely woolly, free or slightly coherent. — Herbs or shrubs with lobed leaves and yellow or purple flowers, the bractlets, calyx, and folded cotyledons sprinkled with black dots.

The species of this important genus have been cultivated so widely in all the warmer regions of the globe, and for so long a time, that there is a large number of varieties looked upon by some authors as species.

- A. Cotton easily separable from the seeds. Seeds naked after the removal of the wool. 1. *G. barbadense*.
- B. Cotton not readily separable. Seeds often with a dense coating of felted hair beneath the cotton.
 - I. Bractlets of epicalyx linear, entire 2. *G. anomalum*.
 - II. Bractlets of epicalyx broad, more or less toothed, rarely entire.
 - a) Lobes of leaf oblong, narrowed at the base, often with a supplementary lobe in the sinus. Flowers purple 3. *G. arboreum*.
 - b) Lobes of leaf ovate, broad, without supplementary lobes. Flowers yellow 4. *G. herbaceum*.

916. (1.) *Gossypium barbadense* L. Spec. Plant. I (1753), p. 982. — DC. Prodrum. I, p. 546. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 53. — Sickenberg. Contrib. Flor. d'Eg., p. 192. — *Gossypium punctatum* Schum. and Thonn. Plant. Guin., p. 310. — *Gossypium vitifolium* Lam. Diet. II, p. 135. — *Gossypium peruvianum* DC. Prodrum. I, p. 456. — A small shrub with smooth, purplish, somewhat angular branches sprinkled with black dots. Leaves stalked, 1-glandulose, deeply palmately 3—5-lobed; lobes oblong-lanceolate, acuminate; upper leaves cordate, sometimes entire or waved at the margin; stalks for the most part as long as the blades. Stipules falcate, persistent. Peduncles angular, 1-flowered, shorter than the petioles. Epicalyx of 3 large, cordate, acute, deeply laciniate segments, the central one longer than the others. Corolla yellow. Ripe capsule 2—5 cm long, ovate, glabrous; valves woody, mucronate. Seeds

free or combined, covered with an easily separable white or nankeen-coloured down. — Flow. February to March.

M. ma. M. p. N. d. N. f. N. v. O. D. l. D. i. D. a. sept. Cultivated everywhere and often spontaneous.

Local name: qotn; qotn-esh-sheger; generally: ashmuny.

The species is cultivated in various parts of India, Japan, Tropical Africa, the South of Europe.

917. (2.) **Gossypium anomalum** Wavra and Peyritsch Sert. Benguel. (1859), p. 22. — *Gossypium Senarense* Fenzl in Sched. Kotschy It. Aethiop. Coll. 90. — A shrub 1.5—4 m high with rough branches. Leaves stalked, downy on both surfaces, cordate with a single gland on the under surface, the lower leaves palmately 5-lobed, the upper ones 3-lobed; lobes roundish or slightly acute. Flowers opposite the leaves. Bracts of the epicalyx entire, linear-lanceolate, twice the length of the calyx, which latter is cup-shaped, 5-lobed; lobes acuminate. Petals reddish. Capsule ovoid, less than 2.5 cm in length, 3-valved; valves tuberculated, woody, acuminate. Seeds 3 or 4 in each cell of the capsule, covered with brownish wool adherent to the seed. — Flow. December to February.

M. ma. N. d. Cultivated abundantly, scarcely naturalized.

Local name: qotn.

A distinct species, the only one truly wild in Africa according to Dr. Welwitsch. The linear segments of the epicalyx, the acuminate calyxlobes, and the small tubercular capsule, afford good means of discriminating this interesting species. (Following Masters in Oliv. Flow. Tropic. Afr. I., p. 211.)

918. (3.) **Gossypium arboreum** L. Spec. Plant. I (1753), p. 983. — DC. Prodr. I, p. 456. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 53. — Sickenberg. Contrib. Flor. d'Eg., p. 191. — A shrub attaining the height of 2—5 m with slender, purplish, pilose branches. Leaves on long stalks, 1-glandulose, deeply palmately 5—7-lobed; lobes oblong-lanceolate, mucronulate, sinuses between the lobes obtuse, often provided with a supplementary lobe. Stipules falcate. Peduncles as long as the petioles, jointed near the summit and often producing a small leaf at the joint. Epicalyx of 3 cordate, ovate, acute, slightly laciniate or nearly entire segments much longer than the cup-shaped, nearly entire calyx. Corolla purple, twice the size of the epicalyx; column antheriferous for nearly its whole length. Capsule about an inch long, oblong; valves coriaceous or woody, mucronate. Seeds free, covered with long white hairs in addition to a close green felt. — Flow. December to February.

M. ma. M. p. N. d. N. f. N. v. Cultivated everywhere and often spontaneous.

Local name: qotn.

Cultivated in most Tropical countries.

919. (4.) **Gossypium herbaceum** L. Spec. Plant. I (1753), p. 983. — DC. Prodrum. I, p. 456. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 52. — Boiss. Flor. Or. I, p. 840. — Sickenberg. Contrib. Flor. d'Eg., p. 190. — *Gossypium hirsutum* L. Spec. Plant. I, p. 984. — DC. Prodrum. I, p. 456. — A branching annual or perennial with smooth or slightly hispid branches besprinkled with black dots. Leaves stalked, upper ones ovate, lower ones cordate, palmately 3—5-lobed; lobes broadly oval acuminate entire or sinuous, 3—5-nerved, 1-glandulose on the under surface. Stalks of lower leaves as long as the blades. Stipules lanceolate entire or slightly cut. Peduncles solitary, axillary, 1-flowered, shorter than the petioles. Epicalyx of 3 cordate, ovate, acute, lacinate or rarely nearly entire segments, which are three times longer than the cup-shaped, nearly entire calyx. Corolla yellow with a purple spot at the base, double the length of the epicalyx. Column bearing anthers near the top only. Ripe capsule oblong, obtuse, 2—2½ cm long, 2 cm wide. Seeds free, covered with whitish cotton closely adherent to the seed. — Flow. December to April.

M. ma. M. p. N. d. N. f. N. v. O. D. i. D. a. sept. D. a. mer.
Abundantly cultivated and often subsontaneous.

Local name: qotn.

The species is cultivated in various parts of Tropical Africa, India, Japan, the South of Europe etc. The wild exists apparently in Scinde and Cabul, where it has been found by Stocks and Dalzell (Following Master in Flor. of Trop. Africa I., p. 212).

63. Sterculiaceae.

Flowers regular, hermaphrodite or unisexual. Calyx usually persistent, more or less deeply divided into 5 or rarely 4 or 3 valvate lobes or segments, or rarely splitting irregularly, or the sepals entirely free. Petals either 5, hypogynous, free, or adhering to the staminal column, contorted-imbricate in the bud, or small and scale-like, or none. Stamens usually united into a ring, a cup, or tube, with 5 terminal teeth or lobes (staminodia) alternating with the petals, and one or more anthers sessile or stipitate (on distinct filaments) in each interval, the anthers 2-celled and opening outwards, in longitudinal slits, or exceptionally the anthers are numerous or the staminodia wanting, or the stamens 5, free and alternate with the sepals, or the anther-cells confluent or opening in terminal pores. Ovary free, 2—5-celled, with the carpels more or less united, rarely 10 or 12-celled, or reduced to a single carpel. Style entire,

or divided into as many branches as there are cells, or rarely styles as many, nearly or quite free. Fruit various. Seeds sometimes hairy but not woolly, sometimes enveloped in pulp or strophiolate, the testa coriaceous, occasionally enclosed in an outer membranous integument; albumen fleshy or none; cotyledons usually foliaceous, flat or folded, the radicle shorter, next the hilum or rarely distant from it. — Herbs, shrubs, or trees, the tomentum or hairs stellate, rarely mixed with simple hairs. Leaves alternate or irregularly opposite, simple and pinnately or palmately nerved, entire toothed or lobed, or digitately compound. Stipules rarely wanting.

A large Order, chiefly tropical, dispersed over the New and the Old World, with some extratropical genera in S. Africa or Australia, and very few species without the Tropics in the northern hemisphere.

353. *Sterculia* Linn.

Flowers unisexual or polygamous. Calyx more or less deeply 5-cleft, rarely 4-cleft, usually coloured. Petals none. Staminal column adnate to the gynophore, bearing at the summit 15 or rarely 10 stamens, irregularly clustered in a head. Carpels of the ovary 5, distinct or nearly so, with 2 or more ovules in each. Styles united under the peltate or lobate stigma. Fruit-carpels distinct, spreading, either firm or woody, and scarcely opening along the inner edge, or thinner and opening as follicles, even long before they are ripe. Seeds 1 or more in each carpel, rarely winged; albumen adhering to the cotyledons, often splitting in two, assuming the aspect of fleshy cotyledons; real cotyledons flat or nearly so, and thin, the radicle next the hilum or at the opposite end, or intermediate. — Trees. Leaves undivided or lobed, or digitately compound. Flowers in panicles or rarely racemes, mostly axillary, sometimes very short; terminal flowers usually female; in these the staminal column is shorter and the anthers less perfect than in the males, surrounding the base of the ovary; in the males the ovary is often entirely abortive.

A large genus whose species are most abundant in tropical Asia. Although there is a general coincidence in habit and in the flowers, yet the fruits and the seeds are so variable that by many they have been made the grounds for separation into distinct genera. The varying position of the radicle with reference to the hilum particularly needs the study of the fresh specimens in all stages of development.

920. *Sterculia tomentosa* Guill. and Perr. in Flor. Seneg. I (1830—33), p. 81 tab. 16. — *Sterculia setigera* Delile Voy. Merœe, p. 61. — A tree 10—20 m high. Branches rugose; younger ones downy.

Leaves approximate, stalked; petioles 6—8 cm long, downy; laminae cordate, roundish, angular or somewhat 3-lobed; lobes acuminate, the central one longest, downy on both surfaces. Flowers numerous, in much-branched axillary panicles; pedicels spreading, downy, as long as or longer than the flower. Flowerbuds broadly ovate. Calyx 1 cm long, cup-shaped, downy, 5-fid; lobes lanceolate, valvate in the bud, ultimately spreading. Staminal column curved, slender, half the length of the calyx, dividing at the extremity into 5 short branches each of which supports three 2-lobed anthers; lobes parallel, surrounding an abortive pilose ovary, with a single curved style. Carpels 3—5, sessile, obliquely oblong, acuminate, ventricose on the upper surface, dehiscent longitudinally, densely tomentose on the outer surface, setose within along the placental line. Seeds numerous, oblong-ovate; testa purplish; tegmen horny, with a yellow horny arillus near the hilum. Albumen 2-parted. Cotyledons flat, adhering to the albumen; radicle turned away from hilum.

M. ma. Alexandria-East; rarely cultivated in gardens, some specimens naturalized near Ramle.

Also known from Tropical Africa.

Parietales.

Herbs, shrubs or trees. Leaves various. Flowers mostly perfect, complete and regular or irregular in Violaceae, sometimes involucrate. Calyx of distinct or essentially distinct sepals. Corolla of distinct petals, rarely wanting. Androecium of usually numerous stamens, but sometimes as few as five. Gynoecium of several united carpels. Ovary superior, mostly with parietal placentae.

64. Elatinaceae.

Flowers regular, hermaphrodite. Sepals 2—5, free, imbricate in the bud. Petals as many, hypogynous, imbricate in the bud, occasionally wanting. Stamens as many or twice as many, hypogynous, free; anthers 2-celled. Torus small, without any disk. Ovary free, with as many cells as there are sepals; styles as many, free from the base, with terminal capitate stigmas. Ovules several in each cell, attached to the inner angle, anatropous. Capsule opening septicidally, the valves flat or concave, with the margins inflexed, leaving more or less of the dissepiments attached to the central column. Seeds straight or curved; testa crustaceous, usually wrinkled or ribbed, albumen none or very thin. Embryo filling the seed, cotyledons short, radicle next to the hilum. — Herbs or low under-

shrubs, aquatic, creeping or diffuse. Leaves opposite or rarely verticillate, entire or seriate. Stipules in pairs. Flowers small, axillary, solitary or in clusters or cymes.

A small Order, dispersed over nearly the whole globe, allied to Hypericineae and Caryophylleae, but differing from the former in habit, in the stipules, and in the perfectly isomerous flowers, from the latter chiefly in the ovary and fruit and want of albumen to the seeds; there is also considerable affinity, especially in habit, with Lythraceae and Crassulaceae. The only two genera of the Order, both of them of wide geographical range, are represented in Egypt.

Sepals membranous, obtuse. Capsule membranous. Glabrous, aquatic or creeping herbs. Flowers 2—4-merous . . . 1. *Elatine*.

Sepals herbaceous in the middle or keeled, acute. Capsule almost crustaceous. Herbs or undershrubs. Flowers usually 5-merous, rarely 3—4-merous 2. *Bergia*.

354. (1.) *Elatine* Linn.

Flowers 3 or 4-merous, rarely 2-merous. Sepals membranous, obtuse, not keeled. Ovary globular. Capsule membranous, the dissepiments either disappearing or remaining attached to the central column. — Small glabrous herbs, either aquatic or creeping on mud. Leaves opposite or verticillate. Flowers usually solitary in the axils, and very small.

The genus is widely dispersed over the temperate and subtropical regions of the globe.

921. *Elatine canpylosperma* Seub. Monogr. Elat. (1845), p. 14. — Boiss. Flor. Or. I, p. 781. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 51 no. 196. — Elcutine Hydropiper Figari Stud. Scient. sull'Egitto, p. 222 not Linn. — *Elatine* Hydropiper var. *pedunculata* Moris Flor. Sard. I, p. 287 tab. 20 fig. 2. — An annual small plant, 1—3 cm high, rarely more. Leaves ovate-oblong, longer than the petiole. Peduncles usually longer than the leaf; stamens 8; seeds semicircular. — Flow. February to April.

N. d. Khanka (Sickenberg.).

Also known from South Europe and Northern- and West-Africa.

355. (2.) *Bergia* Linn.

Sepals usually 5, with an herbaceous midrib and membranous margins, more or less acute or apiculate. Capsule rather crustaceous; valves with their margins incurved or plane. — Herbs or shrubs,

prostrate or diffuse, hispid pubescent or glabrous. Leaves opposite, serrate or entire. Flowers solitary or fasciculate, axillary.

A small genus, widely dispersed in warm countries. Some of the species are peculiar to intertropical Africa.

- A. Glabrous plants 1. **B. aquatica.**
- B. Hairy plants.
 - I. Leaves elliptical-lanceolate; flowers pentandrous. 2. **B. ammanioides.**
 - II. Leaves ovate-lanceolate; flowers decandrous 3. **B. suffruticosa.**

922. (1.) **Bergia aquatica** Roxb. Coromand. (1795), p. 22 tab. 142. — Boiss. Flor. Or. I, p. 782. — DC. Prodrum. I, p. 390. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 51 no. 197. — *Bergia verticillata* Willd. Spec. Plant. II, p. 771. — *Elatine luxurians* Delile Illustr. Flor. d'Eg., p. 13 tab. XX fig. 1. — Glabrous herb, 15—30 cm high, or more, usually with procumbent branches rooting at the nodes. Leaves oval, narrowed to each end, subacute or rather obtuse, finely or obscurely serrulate, membranous or rather succulent, glabrous; venation obscure, 1—2 mm long, 5—6 mm broad; petiole gradually dilating upwards, 2—6 mm; stipules lanceolate-deltoid, 2—5 mm. Flowers in sessile or subsessile, few- or many-flowered axillary clusters. Sepals lanceolate to ovate-lanceolate, obliquely mucronulate. Petals oval-oblong, equalling or exceeding the sepals. Stamens 10; filaments narrow-linear or subulate, subequal. Ovary globose or ovoid-globose; styles very short. — Flow. March to April.

N. d. Rosetta; Damietta; henzale in rize-fields; Damanhur; Mansura; Zaqaziq; Tanta; Qalyûb; Cairo. on the sides of irrigation-canals.

A widely dispersed herb in the Tropics of both hemispheres.

923. (2.) **Bergia ammanioides** Roth Nov. Plant. Spec. (1821), p. 219. — Boiss. Flor. Or. I, p. 782. — DC. Prodrum. I, p. 390. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 51 no. 198. — *Bergia ammanioides* var. *pentandra* Wight Illustr., tab. 25. — *Elatine pentandra* Guill. and Perr. Flor. Seneg. I, p. 42 tab. 12. — *Bergia peploides* Guill. and Perr. Flor. Seneg. I, p. 44. — *Bergia erecta* Guill. and Perr. l. c. (an erect variety, with narrow linear-lanceolate sepals and petals). — An erect or decumbent more or less thinly pilose pubescent or shortly hispid annual, a few cm—30 cm in height. Leaves from oblanceolate to linear-oval, narrowed to the base or into the petiole, generally acute, sharply often distantly serrulate or nearly entire, thinly hispid or glabrescent, 8—12 mm in length, with lanceolate or subulate stipules. Flowers small, in dense, often many-flowered verticillasters, subsessile or pedicels equalling or slightly exceeding

the calyx. Sepals lanceolate to linear, very acute, pilose or hispid and ciliate, about equal to the thin oblanceolate petals. Stamens 5, occasionally varying with fewer or more. Ovary globose; styles very short. — Flow. February to March.

N. v. Qurna; abundantly on the Islands of the Nile. — **N. v. mer.** Near Aswân.

An Indian weed extending also to Australia.

924. (3.) **Bergia suffruticosa** Fenzl. in Denkschrift. Bot. Ges. III (1843), p. 183. — Boiss. Flor. Or. I, p. 783. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 51 no. 199. — Lancretia suffruticosa Del. Illustr. Flor. d'Eg., tab. 25. — Shrubby decumbent or spreading, or rarely pendulous usually with very numerous opposite branchlets, at first shortly hispid; the bark at length somewhat glabrate and deciduous in papery cinnamon-or rust-coloured flakes. Leaves rather thick, varying from broadly elliptical, in the more rigid small-leaved forms, to oval, obtuse or subacute, crenate-serrulate, the margin often revolute, shortly hispid on both sides and often glandular, often fasciated in the axils. sessile or narrowed to the base and subpetiolate, 2—8 mm long. Flowers solitary or in fascicles of 2 to 6 or 8; pedicels shorter than or but slightly exceeding the ovate, thickened above and pointed or apiculate sepals. Petals obovate-oblong. Stamens 10; alternately shorter or nearly equal; filaments opposed to the sepals slightly dilated below. Ovary ovoid, 5-sulcate, narrowed into the styles. Seeds shining, terete, slightly curved. — Flow. March.

N. v. On rocky or sandy ground.

Also in Tropical Africa, extending to India.

65. Frankeniaceae.

Flowers regular, hermaphrodite. Calyx tubular, persistent, with 4, 5, or rarely 6 lobes, valvate in the bud, and as many prominent angles and furrows. Petals as many, hypogynous, imbricate in the bud, free, the claws with an adnate plate or appendage on the inner face, the lamina spreading. Stamens usually 6, sometimes 4 or 5 or indefinite, hypogynous, free or shortly united in a ring at the base, filaments filiform or flattened; anthers 2-celled, versatile. Ovary free, sessile, 1-celled, with 3, rarely 2 or 4 parietal placentas, or very rarely a single one. Style filiform, with as many branches as placentas, the stigmas capitate or oblique. Ovules several, or rarely solitary, to each placenta, attached to rather long ascending funicles, amphitropous or nearly anatropous, with an inferior micropyle. Seeds ovoid or oblong, testa crustaceous, the hilum almost terminal.

Embryo straight, in a mealy albumen, the radicle next the hilum, shorter than or as long as the cotyledons. — Low herbs or undershrubs, much branched and jointed at the nodes. Leaves opposite, small, without stipules, often clustered in the axils. Flowers usually pink or purple, sessile in the forks of the branches, forming a more or less dense, terminal, leafy cyme, sometimes contracted into a globular head.

The Order consists of a single genus, closely to the small group of Diantheae, amongst Caryophylleae, but distinguished by the parietal placentation of the ovary, and by the terminal hilum in the seed. The species are chiefly maritime, and generally distributed over the temperate regions of the globe, more especially of the northern hemisphere, less abundant within the tropics.

356. *Frankenia* Linn.

Flowers regular, hermaphrodite. Calyx gamosepalous, tubular, persistent, 4—6-toothed. Petals as many as calyx-teeth, free, clawed, with a lamelliform appendage on the inner side of the claw. Stamens usually 6, hypogynous, free or very shortly connate at the base, rarely cohering above; filaments flattened or filiform; anthers 2-celled, didymous, dehiscent longitudinally. Ovary 1-celled, with 3 (2—4) parietal multiovulate placentas; style simple, filiform; stigmas 3 or as many as placentas. Capsule enclosed in the persistent calyx, dehiscent in as many valves as placentas. Seeds albuminous, with a straight axile embryo. — Much-branched herbs or small undershrubs, affecting maritime or saline localities. Leaves small opposite exstipulate, often fascicled. Flowers rose to purple, sessile and solitary in the numerous forks or fascicled in leafy heads or cymes.

A small genus, like several other maritime genera of no marked affinity, widely spread over the world in suitable localities.

- A. Leaves obovate. 1. *F. pulverulenta*.
 B. Leaves linear or linear-lanceolate 2. *F. laevis*.

925. (1.) ***Frankenia pulverulenta*** L. Spec. Plant. I (1753), p. 332. — Boiss. Flor. Or. I. p. 779. — Lam. Illustr., tab. 262. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 51 no. 194. — Sickenberg. Contrib. Flor. d'Eg., p. 191. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 599 no. 52. — Aschers. Flor. Rhinocol., p. 792 no. 56. — DC. Prodrum. I, p. 349. — A diffuse or procumbent, much-forking herb, 10—20 cm in height, with opposite, obovate oval or rotundate, often fascicled leaves, usually mealy-puberulous or setulose-pubescent beneath, flattish or with the margins more or less recurved, narrowed into short ciliolate or nearly glabrous petioles, less than

4 mm in length. Calyx tubular, with short acute teeth, equalling the leaves. Filaments membranous, dilated, tapering above and below. — Flow. February to March.

M. ma. Marmarica: Matruqa; Mariut; Alexandria-West and -East; Mandara; Abukîr. — **M. p.** El-'Arish; Henwah; Sheykh-Zoyêd; Bîr-el-Mesa'udîyât. — **N. d. N. f. N. v. O. D. i. D. a. sept.** Common in deep sandy places; often in the shade of shrubs.

Local name: mulleygh; homrâ; khayêt; gurmeyl; ghobeyrâ.

A wide spread species of shores and salt-deserts, occurring in South Europe, India and at the Cape.

926. (2.) **Frankenia laevis** L. Spec. Plant. I (1753), p. 331. — Durand and Barr. Prodrôm. Flor. Libyc., p. 47. — Frankenia hirsuta var. laevis Boiss. Flor. Or. I, p. 780. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 51 no. 195. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 599 no. 53. — Aschers. Flor. Rhinocol., p. 792 no. 57. — Aschers. Flor. Sirbon, p. 811 no. 5. — An perennial plant 10 to 40 cm high, sometimes somewhat more, more or less hirsute or hispid with white spreading hairs, woody at the base. Leaves linear or oblong-linear, ciliate at the base, with revolute margins. — Flow. February to March.

M. ma. Marmarica: Matruqa; Mariut; Alexandria-West. — **M. p.** Qatiya Henwa; Sheykh-Zoyêd; Bîr-el-Mesa'udîyât; el-Gels.

Local name: gurmeyl; ghobeyrâ.

Also known from Morocco, Tunisia, Algeria, Tripolitania and the Mediterranean region of Europe.

var. **revoluta** Durand and Barr. Prodrôm. Flor. Libyc. (1910), p. 47. — Frankenia revoluta Forsk. Flor. aeg.-arab., p. 75. — Frankenia hirsuta var. revoluta Boiss. Flor. Or. I, p. 780. — Frankenia laevis Cosson in Bull. Soc. Bot. Franc. XXXVI, p. 94 not Linn. — Frankenia pallida Coss. in Bull. Soc. Bot. Franc. XXXVI, p. 100 not Boiss. and Reut. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 51 no. 195. — Canescent. Fruiting branches short, erect. — Flow. March to April.

M. ma. Alexandria-West and -East; Abusîr. — **M. p.** Rosetta; Damietta; Port Said.

Local name: heysheb (Forsk.); nemeyshe (Forsk.); suêd (Ascherson).

Also known from Tripolitania and Syria.

66. Tamaricaceae.

Flowers regular, small, usually bisexual. Sepals 5 or 4—6, free, imbricate. Petals as many, free or slightly connate at the

base. Stamens 5—10— ∞ , free, inserted into a small, annular, hypogynous disk, or connate at the base, forming a ring around the base of the ovary, or monadelphous; anthers bilocular, dehiscing longitudinally. Ovary free, 1-celled, with as many multiovulate placentas from the base of the cavity as styles; stigmas 3—4. Seeds with a sessile or a stipitate crest of long hairs, exalbuminous. — Mostly bushes or small trees with minute or squamiform leaves. Flowers white or rose, spicate or in crowded racemes, often paniced.

A small family, most numerous around the Mediterranean and in temperate Asia.

- A. Stamens free, or united only at the base. Trees with minute scale-like leaves. Flowers small, numerous, in spikes. 1. *Tamarix*.
- B. Stamens 5-adelphous, the groups of stamens opposite the petals. Flowers large in few-flowered racemes or solitary. Low shrubs. 2. *Reaumuria*.

357. (1.) *Tamarix* Linn.

Maritime and desert shrubs or trees with slender, twiggy branches, covered with small, green, alternate, scale-like leaves; the flowers small, in terminal spikes or racemes. Sepals 4 or 5. Petals as many. Stamens as many, or twice as many, hypogynous. Ovary free, with 3, rarely 2 or 4 styles. Capsule 1-celled, opening in as many valves as styles. Seeds several, erect, crowned each with a tuft of cottony hairs. No albumen.

A small genus, most numerous around the Mediterranean and in temperate Asia.

- A. *Vernales*: Racemes lateral, appearing before or with the leaves in spring 1. *T. tetragyna*.
- B. *Aestivales*: Racemes later than the leaves, terminal, paniced. Flowers 5-merous.
 - I. Stamens as many as sepals and petals.
 - a) Leaves not sheathing.
 - 1. Disk 10-lobed 2. *T. nilotica*.
 - 2. Disk 5-lobed.
 - α) Styles one-third as long as the ovary 3. *T. mannifera*.
 - β) Styles one-half as long as the ovary 4. *T. arborea*.
 - b) Leaves sheathing, abruptly mucronulate, pitted 5. *T. articulata*.

II. Stamens 8—13.

a) Bracts as long as the calyx.

1. Capsule 2 mm long 6. **T. amplexicaulis**.2. Capsule 5—6 mm long 7. **T. macrocarpa**.b) Bracts half as long as the calyx 8. **T. passerinoides**.

927. (1.) **Tamarix tetragyna** Ehrenberg in Linnaea II (1827). p. 527. — Boiss. Flor. Or. I, p. 768. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 50 no. 186. — Sickenberg. Contrib. Flor. d'Eg., p. 188. — Tamarix deserti Boiss. Diagnos. Plant. Orient., Ser. I fasc. X p. 10. — Tamarix Noëana Boiss. Diagnos. Plant. Orient., Ser. II fasc. II p. 56. — A small tree, 3—5 m high, glaucescent, glabrous. Leaves lanceolate from a broad base, with smooth margins. Racemes peduncled, 8—10 cm long, rather loose; bracts scarious, a little shorter than the flowers; pedicels about as long as the calyx; petals obovate-elliptical, spreading; stamens inserted on lobes of the disk; styles coherent at the base, spatulate, somewhat less than half as long as the ovary. — Flow. March to April.

M. ma. N. d. N. f. O. D. l. D. i. D. a. sept. D. a. mer. A small graceful tree in sandy places. It is very conspicuous from the vivid green of its foliage and its long pendulous spikes of pure white flowers.

Local name: tarfâ.

Also known from Arabia and Babylonia.

var. **Meyeri** Boiss. Flor. Or. I (1867), p. 768. — Sickenberg. Contrib. Flor. d'Eg., p. 188. — Tamarix Meyeri Boiss. Diagnos. Plant. Orient., Ser. I fasc. X p. 9. — Tamarix tetragyna C. A. Mey. Enum., no. 1460 not Ehrenberg. — Leaves subcordate at the base, racemes narrowed and dense; bracts as long as the flowers. — Flow. March.

O. Dakhel.

Also known from Transcaucasia.

928. (2.) **Tamarix nilotica** (Ehrenbg.) Bunge Tentam. Gen. Tamar. (1852), p. 60. — Boiss. Flor. Or. I, p. 775. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 55 no. 187. — Sickenberg. Contrib. Flor. d'Eg., p. 189. — Aschers. Flor. Rhinocol., p. 792 no. 55. — Tamarix gallica var. nilotica and var. heterophylla Ehrenbg. Sched. Herb. Berol. — A small tree, 5—8 m high, sometimes more, glabrous, glaucescent or green. Leaves half-clasping, ovate or deltoid, cordate, acute. Racemes loose; bracts longer than the pedicels; petals obovate-oblong; filaments inserted into the deeper notches of the 10-lobed disk; anthers apiculate; styles half as long as the ovary. — Flow. February to April.

M. ma. Alexandria-West and -East; Mandara; Abukîr. — **M. p.** El-Bassah; Rosetta; Damietta. — **N. d. N. f. N. v. O.** Little Oasis; Dakhel; Great Oasis. — **D. l.** Common in deep sandy places.

Local name: abl (Schweinfurth); generally: tarfâ; hatab ahmar. Also known from Arabia Petraea, Syria and Palestine*).

929. (3.) **Tamarix mannifera** Ehrenbg. in Sched. Herb. Berol. ap. Bunge Tentam. Gen. Tamar. (1852), p. 60. — Boiss. Flor. Or. I. p. 775. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 55 no. 188. — Sickenberg. Contrib. Flor. d'Eg., p. 189. — *Tamarix gallica* var. *mannifera* Ehrenberg. in Linn. II (1827), p. 270. — A small tree, 3—5 m high, sometimes somewhat more, glabrous, glaucous, or white-powdery; branches rather rigid. Leaves half-clasping, ovate-deltoid, acute. Racemes rather short, dense, spreading; bracts, acute, longer than the pedicels; petals obovate-oblong, tapering at the base, inserted into the 5, retuse lobes of the disk; anthers somewhat apiculate; styles 3, obovate, one-third as long as the ovary. — Flow. December to March.

M. p. Rosetta; Damietta. — **N. d. N. f. N. v. O.** Siwa: Great Oasis. — **D. a. sept.** Common on salty places and in deep sand.

Local name: hatab ahmar.

Also known from Arabia Petraea, Palestine and Syria.

*) Sickenberger has published in his Contributions à la Flore d'Egypte. p. 189 a new species *Tamarix aeruginosa* Sickenbg.

Aestivalis, racemi serotini in ramis hornotinis elongatis, terminales paniculati; flores pentameri, styli tres. *Tamarix* inter xeropetalis et ptiopetalis intermedia. Stamina sepalis numero aequalia, capsulae graciles lanceolatae 2 lineas longae vel breviores. Petala partim decidua partim ad fructus maturitatem persistentia. Folia non vaginantia.

Frutex gracilis, cortice fusco-rubro in ramis vetustis cinnamomeo; rami juniores glabri viridi-glaucoscentes aeruginosi.

Foliis omnibus amplexicaulibus, ramulorum hornotinorum subpetalis [sic!], breviter ovatis cuspidatis; racemis racemoso-paniculatis subsessilibus laxiuscule patentibus; bracteis lanceolatis acuminatis pedicellis calyce brevioribus subaequilongis; petalis erectis obovatis concavis roseis; filamentis basi subdilatatis disci minimi et irregulariter subdecemmulto-sublobati lobis impositis. antheris muticis, stylis obovato oblongis, stigmatibus tribus brevibus. Frutex gracilis habitu *T. gallicae* accedens, colore aeruginoso insignis.

O. fréquent à Omm ed Debadeb, Oasis Abbassie, au Nord de Khargeh, 20 Févr. 1893!

As I have seen no material, I have not included it in the Manual Flora of Egypt. Possibly the plant in question may be a variety either of *Tamarix tetragyna* Ehrenberg or *Tamarix nilotica*.

930. (4.) **Tamarix arborea** Bunge Tentam. Gen. Tamar. (1852), p. 67. — Boiss. Flor. Or. I, p. 775. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 50 no. 189. — Sickenberg. Contrib. Flor. d'Eg., p. 189. — *Tamarix gallica* var. *arborea* Ehrenberg in Linnaea II (1827). p. 269. — A small tree, 3—4 m high, rarely somewhat more, glabrous, glaucous, branches turgid; leaves half-clasping, ovate-deltoid, acute; racemes abbreviate shortly paniculate; bracts acute; pedicels as long as the calyx or somewhat longer; petals oblong, connivent; filament broadly angulate at the base, inserted into the notches of the disk; anthers apiculate; style obovate-oblong half as long as the ovary. — Flow. December to March.

M. ma. N. d. N. f. N. v. O. D. a. sept. Not rare in the Wadies and in sandy places.

Local name: hatab ahmar.

Only known from Egypt.

931. (5.) **Tamarix articulata** Vahl Symb. (1781), no. 48 tab. 32. — Boiss. Flor. Or. I, p. 777. — Aschers. Flor. Rhinocol., p. 792 no. 55. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 50 no. 190. — Sickenberg. Contrib. Flor. d'Eg., p. 189. — *Thuya aphylla* L. Spec. Plant. I, p. 1422. — A bush or small tree, the slender ultimate branchlets usually hoary with a saline efflorescence from the impressed-punctate glands, and closely jointed, each article oblique and apiculate above, the leaves being reduced to their sheathing base, the free part to a minute triangular tooth. Flowers in spicate usually interrupted racemes, often less crossed them in *Tamarix nilotica*, but various. — Flow. February to March.

M. ma. M. p. N. d. N. f. N. v. O. D. l. D. i. D. a. sept. D. a. mer. R. Everywhere common in sandy and salty places.

Local name: athl; generally: hatab ahmar; abl. — In Nubia: fâreq.

Occurs South of the Tropics, also in North Africa and eastward to India.

932. (6.) **Tamarix amplexicaulis** Ehrenberg in Linnaea II (1827), p. 275. — Boiss. Flor. Or. I, p. 778. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 50 no. 191. — Sickenberg. Contrib. Flor. d'Eg., p. 189. — A bush or small tree, 2—3 m high; glabrous, glaucous; leaves impressed-punctate, clasping, deltoid-cordate, racemes terminal, subpaniculate, dense, erect; bracts as long as the calyx, longer than the very short pedicels; petals elliptical; sepals 10 inserted on the lobes of the disk; anthers apiculate; capsule 2 mm long. — Flow. March.

O. Siwa; Dakhel; Great Oasis. — D. a. sept. 'Ayun Musa.

Local name: hatab ahmar.

Only known from these localities.

933. (7.) **Tamarix macrocarpa** Bunge Tentam. Gen. Tamar. (1852), p. 79. — Boiss. Flor. Or. I, p. 779. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 50 no. 193. — Sickenberg. Contrib. Flor. d'Eg., p. 189. — *Tamarix passerinoides* var. *macrocarpa* Ehrenberg in Linnaea (1827), p. 276. — A shrub, 3—5 m high, or more, green or glaucescent, glabrous. Leaves pitted, nearly clasping, cordate. Racemes 5—10 cm long, loose; bracts about as long as the pedicels; petals ovate-elliptical; lobes of disk 10, tapering into the filaments of the 10 stamens; anthers apiculate; styles short; capsules 1 cm long. — Flow. March to April.

N. f. Medinet-el-Fayûm; Tamîa; Senûris; Senhûr; Wady-el-Hagg. — **O.** Great Oasis. — **D. i. D. a. sept.** Common in the Wadies.

Local name: hatab ahmar.

Also known from Arabia Petraea, Palestine to Persia. It is a very common shrub throughout the Eastern desert, in many places forming thickets.

934. (8.) **Tamarix passerinoides** Del. Illustr. Flor. d'Eg. (1813), no. 352. — Boiss. Flor. Or. I, p. 778. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 50 no. 192. — Sickenberg. Contrib. Flor. d'Eg., p. 189. — *Tamarix pycnocarpa* DC. Prodr. I, p. 97. — *Trichaurus Aucherianus* Decsne in Jacq. Voy., p. 59. — *Trichaurus pycnocarpus* Decsne in Jacq. Voy., p. 59. — A small shrub, glabrous, glaucous; leaves impressed-punctate, half-clasping, cordate; racemes spiciform, dense; bracts half as long as the pedicels and the calyx; petals ovate-elliptical; lobes of the disk 10—13; filaments inserted on the lobes; anthers apiculate; styles very short or 0; capsule 3—4 mm long. — Flow. March to April.

N. f. Medinet-el-Fayûm; Senûris. — **O.** Siwa; Dakhel; Great Oasis. — **D. i. D. a. sept.** Common in the Wadies.

Local name: hatab ahmar.

Also known from Transcaucasia, Afghanistan and Persia.

358. (2.) **Reaumuria** Linn.

Calyx 5-lobed or parted, many-bracted at the base. Petals 5, white, equal or unequal, with a longitudinal, fringed, adnate scale on both sides of the base. Stamens ∞ , connate at the base, in 5 groups opposite the petals, inserted into a fleshy ring surrounding the base of the ovary. Ovary globular-pentagonal. Styles 5, filiform. Placentae septiform, 4—10-ovuled, erect, fixed at base and apex, otherwise free. Capsule cartilaginous, with 5, persistent, at length deflexed valves. Seeds few, fleshy. — Glauous, much branched shrubs or small trees, with coriaceous or fleshy, dotted leaves.

A small genus widely distributed in the desert region.

- A. Filaments crenate-dentate 1. *R. hirtella*.
 B. Filaments entire 2. *R. mucronata*.

935. (1.) **Reaumuria hirtella** Jaub. and Spach Illustr. Plant. Orient. III (1847—50), p. 54 tab. 244. — Boiss. Flor. Or. I, p. 760. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 50 no. 184. — Sickenberg. Contrib. Flor. d'Eg., p. 188. — *Reaumuria vermiculata* L. Spec. Plant. I, p. 754 ex parte. — A shrub of 20—40 cm high or sometimes somewhat more, hirtellous; branches erect. Leaves half-terete, oblong-linear, from a subcordate base, obtuse, those of the axillary twigs much crowded. Bracts dense, shorter than the calyx, erect, oblong; lobes of the calyx oblong, with an obtuse triangular tip; petals somewhat oblique, a little longer than the calyx; dilated part of the filaments crenate-dentate. — Flow. October to January.

D. a. sept. Common in all the Wadies on calcareous ground.

Local name: 'adbe (Forsk.); generally: mulleyh.

Also known from Arabia Petraea and Palestine.

936. (2.) **Reaumuria mucronata** Jaub. and Spach Illustr. Plant. Orient. III (1847—50), p. 57 tab. 245. — Boiss. Flor. Or. I, p. 760. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 50 no. 185. — Sickenberg. Contrib. Flor. d'Eg., p. 189. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 598 no. 51. — *Reaumuria vermiculata* L. Spec. Plant., p. 754 ex parte. — *Reaumuria stenophylla* Jaub. and Spach. — A small shrub of 30—50 cm in height, glabrous; branches erect or diffuse. Leaves half-terete short-linear, acute; flowers irregularly paniculate, or sometimes terminal and solitary; bracts dense, mucronate, erect-patule, the upper-ones as long as the calyx; lobes of the calyx oblong, shortly mucronate; petals unequal; filaments entire. — Flow. March.

M. ma. Marmarica: Matruqa; Ras-el-Kena'is; Alexandria-East and -West; Abukîr.

Local name: mulleyh.

Also known from all the deserts of Northern Africa.

67. Cistaceae.

Shrubs or herbs, with opposite, or, in a few species, alternate leaves, with or without stipules; the flowers in terminal racemes. Sepals 3, nearly equal, overlapping each other in the bud, with or without 2 smaller outer ones. Petals 5, or rarely fewer, broadly spreading. Stamens numerous, hypogynous, and free. Ovary and style single. Capsule 1-celled, or incompletely divided into several cells, opening in 3, 5, or 10 valves, which bear along their centre

as many placentas or imperfect partitions. Seeds several, the embryo curved, imbedded in albumen.

A small Order, spread chiefly over southern and western Europe and northern Africa, with a few American species. It corresponds with the old Linnean genus *Cistus*, which is now limited to the large-flowered species with 5 valves to the capsule.

- A. All the stamens fertile 1. *Helianthemum*.
- B. The outer stamens sterile 2. *Fumana*.

359. (1.) *Helianthemum* Linn.

Woody herbs or low shrubs, more or less branching, mostly with showy flowers. Petals 5, yellow or purple, fugacious. Stamens numerous. Placentae or false septa 3, ovules few-many; style short or filiform or spatulate, jointed with the ovary; stigma capitate or 3-lobed. Embryo curved.

A large genus widely distributed in Europe and the Mediterranean region.

- A. Petals evolute, longer than the inner sepals; stamens 30—100.
 - I. All the stipules linear-subulate filiforme, the lower and middle ones as long as the petiole, the upper ones longer 1. *H. virgatum*.
 - II. Stipules lanceolate, one third to one-half connate with the petiole.
 - a) Pedicels as long as the sepals. Calyx vesicarious-inflate. The whole plant greyish-tomentose. Flowers rose-coloured 2. *H. vesicarium*.
 - b) Pedicels longer than the petals. Calyx vesiculose-inflate. Green plants. Flowers rose-coloured 3. *H. ciliatum*.
- B. Petals evolute, shorter than the inner sepals; stamens 7—20.
 - I. Style long, filiform. Capsule rotundate-trigynous, pubescent. Small shrubs.
 - a) Flowers pedicellate.
 - 1. Fructiferous pedicels as long as the inner sepals or somewhat longer.
 - α) Pedicels 4—6-times as long as the inner sepals 4. *H. Schweinfurthii*.
 - β) Pedicels as long as the inner sepals 5. *H. cahiricum*.

2. Fructiferous pedicels shorter than the sepals 6. *H. Sancti Antonii*.
- b) Flowers sessile or nearly so.
1. Shrubs somewhat intricate 7. *H. ellipticum*.
2. Shrubs evidently intricate 8. *H. Lippii*.
- II. Style short, erect. Capsule triquetrous, glabrous. Annuals.
- a) Fructiferous pedicels erect; bracteoles foliaceous as long as the flowers . . . 9. *H. ledifolium*.
- b) Fructiferous pedicels patent; bracteoles shorter than the flowers 10. *H. salicifolium*.

937. (1.) **Helianthemum virgatum***) (Desf.) Pers. Synops. II (1807). p. 79. — DC. Prodrum. I, p. 282. — Boiss. Flor. Or. I, p. 441. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 595 no. 33. — Willk. Icon. and descr. Plant. II, tab. 106 fig. A. B. — *Cistus virgatus* Desf. Flor. Atlant. II, p. 422. — Branches virgate, white-tomentose, rarely reddish. Leaves flat, often revolute at the margin, linear-lanceolate, green on the upper surface, stellate-tomentose on the under surface, shortly petioled; stipules subulate, filiform, 3—5 mm long. Racemes long pedunculate, 5—10-flowered; pedicels longer than the sepals; sepals obtuse, canescent or purple or pale-yellow, the outer three times as long as the inner ones, the inner ones broadly ovate, 5—7 mm long; petals rose-coloured. Capsule small, enclosed by the sepals; stellate-puberulous; seeds brown, angulate, granulate. — Flow. March to April.

M. ma. Marmarica: Dakalla; Ras-el-Kena'is; Alexandria-West. Also known from the other parts of the Mediterranean region.

938. (2.) **Helianthemum vesicarium** Boiss. Diagnos. Plant. Orient., Ser. I fasc. VIII (1849) p. 80. — Flor. Or. I, p. 442. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 45 no. 129. — Sickenberg. Contrib. Flor. d'Eg., p. 182. — Stapf Additions Flor. Marmaric., p. 366. — Grosser in Engler, Das Pflanzenr. IV, fasc. 193 p. 76. — Willk. Ic. Plant. II, p. 105 tab. 134. — *Helianthemum roseum* Ehrenbg. in Herb. Berol. — An undershrub, 15—20 cm high or sometimes somewhat more appressed-canescens. Leaves oblong to linear, obtuse, margins revolute. Stipules linear, half as long as the leaves. Racemes loose; pedicels about as long as the calyx; petals pinkish purple; nerves of the inner sepals sparingly hispid. — Flow. March.

*) The classification of the family adopted in this work is that followed by W. Grosser in his well-known "Cistaceae", in Engler "Das Pflanzenreich" Leipzig 1903 (IV, fasc. 193).

M. ma. Marmarica: Ras-el-Kena'is; Mariut; Alexandria-West and -East.

Also known from the other parts of the North African deserts, Arabia Petraea and Syria.

939. (3.) **Helianthemum ciliatum** (Desf.) Pers. Synops. II (1807), p. 79. — DC. Prodrum. I, p. 283. — Grosser in Engler, Das Pflanzenr. IV, fasc. 193 p. 76. — *Cistus ciliatus* Desf. Flor. Atlant. I, p. 421 tab. 109. — Branches virgate, white. Leaves lanceolate, 2—4 cm long, 2—5 mm broad, green on the upper surface, canescent on the under surface, revolute at the margin, more or less dense hirsute, shortly petioled. Racemes long-pedunculate, 5—12-flowered; pedicels as long as the fructiferous sepals, tomentose; inner sepals 1—2 cm long, the outer one green, spathulate; petals pale rose-coloured, 1.5 cm long; capsule enclosed by the sepals; stellate-puberulous; seeds brownish, pruinose. — Flow. March to May.

M. ma. Matruqa (Schweinfurth); Alexandria-West, rare.

Also known from Algeria, Tunisia and Tripolitania.

var. **pseudo vesicarium** Grosser in Engler, Das Pflanzenreich IV, fasc. 193 (1903) p. 76. — The outer sepals ciliate, the inner-ones between the costas ciliate-setulose.

M. ma. Marmarica: Matruqa; Alexandria-West, rare.

Also known from Tripolitania.

940. (4.) **Helianthemum Schweinfurthii** Grosser in Engler, Das Pflanzenreich IV, fasc. 193 (1903) p. 95. — Small bush, intricate, branched from the base. Leaves oval-lanceolate, 1.2—1.7 cm long, 3—5 mm broad, green, somewhat revolute at the margin, on both surfaces stellate-hairy, often linear, only 0.5—1 cm long, 1—2 mm broad, densely villous, whitish. Racemes 6—10-flowered, loose; flowers long pedicellate, small; outer sepals linear, half as long as the inner ones, oval-acuminate; petals of the chasmogame flowers as long as the sepals, lanceolate, yellow; capsule as long as the inner sepals, dense and long-villous; seeds compressed, yellow, obsoletely papillous. — Flow. March to April.

D. a. sept. Gebel Shaluf.

Only known from this locality.

941. (5.) **Helianthemum cahiricum** Delile Illustr. Flor. d'Eg. (1813), p. 93 tab. 31 fig. 2. — Grosser in Engler, Das Pflanzenreich IV, fasc. 193 (1903) p. 95. — DC. Prodrum. I, p. 274. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 45 no. 126. — Sickenberg, Contrib. Flor. d'Eg., p. 182. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 595 no. 31. — Boiss. Flor. Or. I, p. 442. — Willk. Icon. Plant. II, p. 98

tab. 127. — *Helianthemum kahiricum* β *angustifolium* Boiss. Flor. Or. Supplem., p. 70. — *Helianthemum libycum* Pomel Nouv. Mat. Flor. Atlant., p. 352. — *Helianthemum acutiflorum* Ehrenberg in Herb. Berol. — *Cistus stipulatus* β Forsk. Flor. aeg.-arab., p. 101. — An undershrub, 15—30 cm high, ashy stellate-puberulent. Leaves oblong to linear, with revolute margins. Racemes dense, many-flowered; pedicels as long as, or shorter than the calyx, recurved. Petals of the chasmogame flowers yellow. — Flow. March to April.

M. ma. Marmarica: Matruqa; Alexandria-West and -East. —

D. a. sept. Cairo, in the desert a characteristic plant in deep sand: Helwân, common in sandy places.

Local name: egdim (Wilkinson); khosheyn (Forsk.).

The cleistogamic flowers are described and figured by Ascherson in Ges. Naturf. Freunde Berlin 1880, p. 98—99.

Also known from Arabia Petraea and Sinai.

942. (6.) ***Helianthemum Sancti Antonii*** Schweinfurth in Aschers.-Schweinf. Ill. Flor. d'Eg. (1889), p. 45 no. 125. — Boiss. Flor. Or. Supplem., p. 70. — Grosser in Engler, Das Pflanzenreich IV. fasc. 193 (1903) p. 96. — An intricate shrub; floriferous branches pungent, often aphyllous. Leaves small, 5—8 mm long, 1—3 mm broad. Flowers small; sepals elliptical-lanceolate, acuminate, on the inside sparingly pilose or wholly glabrous, the inner ones at least 5 mm long, 3 mm broad; floriferous pedicels half as long as the inner sepals, at least as long as they, but never longer; petals yellow, twice as long as the sepals; capsule villose; seeds compressed: brownish. — Flow. March to April.

D. a. sept. Galâla.

Local name: gaddim.

Also known from Palestine (Zerka Maïn).

943. (7.) ***Helianthemum ellipticum*** (Desf.) Pers. Synops. II (1807), p. 78. — DC. Prodr. I, p. 274. — Grosser in Engler, Das Pflanzenreich IV. fasc. 193 (1903) p. 96. — *Cistus ellipticus* Desf. Flor. Atlant. I, p. 418 tab. 107. — *Cistus stipulatus* α Forsk. Flor. aeg.-arab., p. 101. — *Helianthemum Lippii* Del. Illustr. Flor. d'Eg., p. 93 not Pers. — *Helianthemum Lippii* α *pedicellatum* Spach. Hist. vég. Phan. VI, p. 21. — *Helianthemum rosmarinifolium* Pers. Symb. Bot. I, tab. 21. — *Helianthemum Ehrenbergii* Willk. Icon. Plant. II, p. 99 tab. 128. — *Helianthemum Lippii* var. *ellipticum* and var. *Ehrenbergii* Boiss. Flor. Or. I, p. 443. — *Helianthemum argyraeum* Baker in Kew Bull., p. 329. — *Helianthemum lavenderifolium* Sieb. Plant. palaest. not Pers., not DC. — An shrub, 30 to 40 cm high, ashy stellate-canescant. Leaves elliptical to linear with

revolute margins. Racemes dense, many flowered; flowers sessile or nearly so. Petals of the chasmogame flowers yellow. — Flow. March to April.

M. ma. Marmarica: Matruqa; Alexandria-West and -East; Mandara; Abukir. — **M. p.** El-Qantara to El-^cArîsh. — **D. a. sept.** Cairo: Gebel aswad.

Local name: khosheyn.

Also known from the other parts of the Mediterranean region.

944. (8.) **Helianthemum Lippii** (L.) Pers. Synops. II (1807), p. 78. — Grosser in Engler, Das Pflanzenreich IV, fasc. 193 (1903) p. 98. — DC. Prodrum. I, p. 273. — Willk. Ic. II, p. 100 tab. 129. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 45 no. 127. — Sickenberg. Contrib. Flor. d'Eg., p. 182. — *Cistus Lippii* L. Mant. II, p. 245. — *Helianthemum ellipticum* γ *micranthum* Boiss. Flor. Or. I, p. 443 ex parte. — *Helianthemum albicans* Ehrenberg Plant. aeg. exsicc. — *Helianthemum Lippii* var. *arabicum* Schweinf. in Herb. Berol. — Small shrub, calspitous, branches trichotomously-branched; leaves green or glaucous, elliptical or obovate-lanceolate 5—10 mm long, 1—4 mm broad, often soon deciduous. Racemes terminal, 6—12-flowered; the outer-sepals linear, half as long as the inner-ones; the inner ones elliptical or ovate-elliptical, mucronate; petals yellow ovate-oblong somewhat longer than the inner sepals; stamens half as long as the sepals, circa 10; capsule villous; seeds angulate-compressed, brownish. — Flow. February to March.

M. ma. Mariut; Alexandria-West. — **M. p.** El-^cArîsh. — **D. i.** **D. i. D. a. sept.** A common characteristic plant in the Mouth of all the Wadies, growing in deep sandy places.

Local name: khosheyn (Forsk.); ralah (Wilkins.); ra'al (Ascherson).

Everywhere in North African Deserts and in Arabia Petraea and Palestine.

945. (9.) **Helianthemum ledifolium** (L.) Mill. Gard. Dict. ed. 8 (1768), no. 20. — Willk. c., Ip. 85 tab. 120—126. — Grosser in Engler, Das Pflanzenreich IV, fasc. 193 (1903) p. 101. — DC. Prodrum. I, p. 272. — *Cistus ledifolius* L. Spec. Plant. I, p. 527. — *Cistus niloticus* L. Mant. I, p. 246. — *Cistus lanuginosus* Viv. Flor. Libyc., p. 28 tab. 14 fig. 3. — *Helianthemum niloticum* Pers. Synops. II, p. 78. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 74 no. 123. — Boiss. Flor. Or. I, p. 441. — Sickenberg. Contrib. Flor. d'Eg., p. 182. — Aschers.-Schweinf. Prim. Flor. Marmaric., p. 595 no. 29. — DC. Prodrum. I, p. 272. — *Helianthemum annuum* Fish in Steud. Nom. ed. 2, p. 733. — An annual herb, 30—50 cm high, sometimes somewhat more, erect, crisply hirsute, branching above. Leaves

oblong to linear, obtuse or acutish. Racemes 10—20 cm long, loose; pedicels thick, shorter than the floral leaves, and often shorter than the calyx; capsules ovate-globular, 1 cm broad, glabrous, ciliate at the angles. — Flow. March to April.

M. ma. Marmarica: Matruqa; Mariut-Bringi; Alexandria-West.

— **D. a. sept.** Wady Warag in the Northern Galala.

Also known from the other parts of the Mediterranean region.

946. (10.) **Helianthemum salicifolium** (L.) Mill. Gard. Dict. ed. 8 (1768), p. 21. — Grosser in Engler, Das Pflanzenreich IV, fasc. 193 (1903) p. 104. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 45 no. 124. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 595 no. 30. — Sickenberg. Contrib. Flor. d'Eg., p. 182. — *Cistus salicifolius* L. Spec. Plant. I. p. 527. — Boiss. Flor. Or. I, p. 441. — *Cistus micranthus* Viv. Flor. Libye., p. 28 tab. 14 fig. 4. — *Helianthemum denticulatum* Thib. in Pers. Synops II, p. 78. — DC. Prodom. I, p. 272. — *Helianthemum retrofactum* Friv. and *Helianthemum refractum* Friv. in shed. — *Helianthemum tripetalum* Micev. in Bull. Soc. Bot. Franc. XIV, p. 144. — An annual herb, 10—30 cm high, hirsute, branching from the base. Leaves obovate to oblong and often lanceolate. Pedicels longer than the floral leaves and the calyx; capsules ovate-globular, 5 mm long, glabrous, as long as the ovate, velvety sepals. — Flow. March to April.

M. ma. Marmarica: Matruqa; Alexandria-West, rare. — **M. p.** Rosetta; Damietta; Quatiya; El-'Arish, in deep sandy places.

Also known from the other parts of the Mediterranean region.

360. (2.) **Fumana** Spach.

Sepals 5, the outer two minute, recurved, the inner ones equal scarious between the nerves. Petala 5, yellow-brownish. Stamens numerous. 10—40, the outer ones sterile, filaments articulate, shorter than the fertile one. Ovary globose, trigonous, subtrilocular; placentas as filiform, 2—4-ovulate; ovules anatropous, pendulous; styles gracious, geniculate at the base or suberect as long as the stamens, thickened at the tip; stigma trilobed, recurved at the margin. Embryo circumflexed, cotyledons circumflexed. — Shrubs dense caespitose or sometimes erect, branches diffused or strictly erect. Leaves small, narrow, alternate or opposite, stipulate or without stipules. Flowers in racemes, shortly pedicelled or often sessile, often deflexed.

A small genus of 9 species in the Mediterranean region, Middle Europe and Western Asia.

947. **Fumana thymifolia** (L.) Halasey Cons. Flor. Graec. I (1901), p. 136. — Grosser in Engler, Das Pflanzenreich IV fasc. 193

(1903), p. 129. — *Cistus thymifolius* L. Spec. Plant. I, p. 528. — *Cistus syrticus* Viv. Flor. Libyc. Spec., p. 27 tab. 14 fig. 2. — *Helianthemum thymifolium* Pers. Synops. II, p. 79. — DC. Prodr. I, p. 276. — *Anthelis glutinosa* Raf. Chlor. aetn., p. 9. — *Helianthemum glutinosum* Benth. Cat. Pyr., p. 85. — *Helianthemum glandulosum* Presl. in Oken Isis XXI, p. 275. — *Fumana viscida* Spach Hist. Veg. Phan. VI, p. 12. — *Fumana glutinosa* Boiss. Flor. Or. I, p. 449. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 45 no. 130. — Sickenberg. Contrib. Flor. d'Eg., p. 182. — Aschers.-Schweinf. Primit. Flor. Marmaric., p. 595 no. 34. — *Fumanopsis glutinosa* Pomel Nouv. Mat. Flor. Atlant., p. 9. — A small shrub, 15—25 cm high, minutely glandular-puberulent, viscid. Leaves nearly all opposite, needle-like, with revolute margins, the floral ones much shorter. Pedicels thread-like; nearly twice as long as the calyx, spreading. Style straight, oblique. — Flow. January to April.

M. ma. Marmarica: Matruqa; Bîr Hammâm; Mariut; Alexandria-West and -East; common on sand-hills.

Also known from all the other parts of the Mediterranean region to Persia.

68. Violaceae.

Flowers usually hermaphrodite. Sepals 5, imbricate. Petals 5, imbricate, equal or unequal, with the lower one larger, or spurred or otherwise dissimilar. Stamens 5, hypogynous or nearly so, the anthers erect and connivent or connate round the pistil, sessile or on short filaments, the connective often very broad, with the anther-cells opening inwards. Ovary free, sessile, 1-celled, with usually 3 parietal placentas, and several or rarely only 1 or 2 anatropous ovules to each placenta. Style usually simple, often thickened or curved at the top. Fruit a capsule, opening in as many valves as placentas, or rarely an indehiscent berry. Seeds with a fleshy albumen; embryo axile, usually straight, the cotyledons usually broad and flat, the radicle next the hilum. — Herbs or shrubs. Leaves usually alternate, simple, and rarely lobed or cut, with lateral stipules. Flowers axillary, solitary, or in cymes or panicles, very rarely in racemes. Pedicels usually with 2 bracteoles. Capsules often opening elastically.

An Order generally dispersed over the globe.

361. *Viola* Linn.

Sepals produced into a small appendage or protuberance below the insertion. Petals spreading, the lowest usually larger, spurred or saecate at the base. Anthers nearly sessile, the connectives flat,

produced into a membranous appendage beyond the cells, those of the 2 lower anthers usually bearing a small dorsal reflexed protuberance or spur. Style variously thickened or dilated at the top, straight with a terminal stigma, or incurved with the stigma in front. Capsule opening elastically in 3 valves. Seeds ovoid-globular with a crustaceous testa. — Herbs, with the stipules usually foliaceous and persistent. Peduncles axillary, 1-flowered. Most species, besides the perfect flowers, produce later in the season small apetalous (cleistogamie) but very prolific flowers.

A very large genus, most of the species natives of the temperate regions of the northern hemisphere, or of the high mountains of South America, with a very few dispersed over Africa, Australia, and New Zealand.

948. **Viola odorata** L. Spec. Plant. I (1753), p. 458. — Boiss. Flor. Or. I, p. 458. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 45. — Sickenberg. Contrib. Flor. d'Eg., p. 182. — Perennial stock short, but sometimes branched, knotted with the remains of the old leaf-stalks and stipules, and usually emitting creeping runners or scions. Leaves in radical (or rather terminal) tufts, broadly cordate, rounded at the top, and crenate, downy or shortly hairy, with rather long stalks. Stipules narrow-lanceolate or linear, and entire. Peduncles about as long as the leaf-stalks, with a pair of small bracts about half way up. Flowers nodding, of the bluish-purple colour named after them, or white, more or less scented. Sepals obtuse. Spur of the lower petal short. Stigma pointed, horizontal or turned downwards. — Flow. October to March.

M. ma. M. p. N. d. N. f. N. v. D. i. D. a. sept. Cultivated abundantly in gardens and often subspontaneous.

Local name: benefshig.

Widely spread over Europe and Asia, extending northward to temperate Sweden.

69. Passifloraceae.

Calyx-tube short or rarely elongated; lobes 4 or 5, valvate or more or less imbricate in the bud, often coloured inside. Petals as many as calyx-lobes, inserted at their base and alternating with them, often persistent with them and much resembling them, sometimes small or rarely wanting. Stamens usually as many as calyx-lobes, rarely twice as many, inserted at the base of the calyx, but often connate with the ovary-stalk to near the top and appearing to be there inserted. Ovary usually stalked, 1-celled, with 3 or rarely 5 parietal placentas, each with several ovules. Style divided into as many branches as there are placentas, with terminal stigmas.

Fruit indehiscent and succulent or opening in valves between the placentas. Seeds often arillate; albumen fleshy. Embryo straight, with leafy cotyledons, the radicle next the hilum. — Climbers, or rarely, in genera not Egyptian, erect herbs or shrubs. Leaves alternate, entire or divided, with stipules. Flowers hermaphrodite or unisexual, solitary or in cymes or racemes, or axillary peduncles. Tendrils axillary, often accompanying or terminating the peduncles.

The Order is dispersed over the tropical and subtropical regions of the New and the Old World.

362. *Passiflora* Linn.

Calyx-tube short. Petals rarely wanting and often like the calyx lobes. One or several rings of coloured filaments or appendages forming a corona within the petals. Stamens as many as calyx-lobes, so united with the ovary-stalk as to appear to be inserted at or near its summit. Styles 3, with large capitate stigmas. Fruit succulent or pulpy, indehiscent, or opening obscurely in 3 valves. — Climbers with axillary tendrils. Leaves entire or palmately lobed or divided. Flowers usually hermaphrodite, the calyx-lobes coloured inside nearly or quite as much as the petals.

The species are numerous in tropical or subtropical America, with a very few from Africa, Asia, and the Pacific Islands.

949. *Passiflora coerulea* L. Spec. Pl. nt. I (1753), p. 959. — A perennial plant. Leaves palmately 3-lobed, acute serrate; petioles biglandular; peduncles 3-bracted; sepals with a horn-like point below the apex, bluish within; filaments of the crown in about 5 rows, the 2 outer ones as long as the sepals; berry large, oval. — Flow. December to February.

M. ma. M. p. N. d. N. f. N. v. Cultivated everywhere in gardens often semi-naturalized.

Local name: sherk falek.

A Native of South America.

70. *Ca...*

Short-lived trees, with erect sap or rarely branched stems composed of a thin shell of soft fibrous wood surrounding a large central cavity divided by thin woody partitions at the nodes, covered with thin green or gray bark marked by the ring-like scars of fallen leaf-stalks, and stout spreading roots. Leaves simple, palmately lobed or digitate, crowded toward the top of the stem and branches, large, flaccid, strongly palmately nerved, and

usually deeply and often compoundly lobed. Flowers regular, monoecious or polygamo-dioecious, white, yellow, or greenish-white, in axillary cymose panicles, the staminate ones elongated, pedunculate, and many-flowered, the pistillate ones abbreviated and few or usually 3-flowered, generally unisexual and dioecious, occasionally polygamo-dioecious, each flower in the axil of a minute ovate acute bract; calyx minute, 5-lobed, the lobes alternate with the petals; corolla of the staminate flower salverform, gamopetalous, the tube elongated, 5-lobed, the lobe oblong or linear, contorted in the bud; stamens 10; filaments free, those of the outer row alternate with the lobes of the corolla and elongated, the others alternate with them and abbreviated; anthers 2-celled, erect, opening longitudinally often surmounted by their slightly elongated connative; ovary rudimentary, subulate; pistillate flower: calyx minute, 5-lobed, persistent under the fruit: corolla polypetalous, petals 5, linear-oblong, erect, ultimately spreading above the middle, deciduous; ovary free, sessile, one-celled or more or less spuriously 5-celled; style 0 or abbreviated; stigmas 5, linear, radiating, dilated and subpalmately lobed at the apex; ovules indefinite, inserted in two rows on the placenta, anatropous, long-stalked; micropyle superior; rhaphe ventral; hermaphrodite flower, corolla gamopetalous, tubular-campanulate, the lobes erect or spreading or subreflexed; stamens 10, in 2 ranks, or 5; ovary ovoid-oblong, longer than the tube of the corolla, more or less spuriously 5-celled below. Fruit slightly 5-lobed, 1-celled or more or less completely 5-celled, filled with soft pulp, many-seeded, that produced from the hermaphrodite flowers long-stalked, pendulous, usually unsymmetrical, gibbous, and smaller than that from the pistillate flowers. Seeds ovoid, inclosed in membranaceous silvery-white sac-like arils, occasionally germinating within the fruit; seed-coat crustaceous, closely investing the membranous inner coat, the outer coat becoming thick, rugose, succulent, and ultimately dry and leathery; embryo in the axis of fleshy albumen; cotyledons ovate, foliaceous, compressed, longer than the terete radicle turned toward the minute pale sub-basilar hilum.

This family with only two genera is tropical American and Mexican, a single representative of one of the genera reaching the shores of Southern Florida.

363. *Carica* Linn.

Flowers unisexual or sometimes hermaphrodite. Male flowers: Calyx small, 5-lobed; corolla hypocrateriform, the tube slender, elongated, lobes oblong or linear, valvate or contorted; stamens 10, inserted at the throat of the corolla, biseriate; anthers 2-celled; ovary rudimentary, subulate. Female flowers: Calyx of the males;

petals 5, linear-oblong, erect, deciduous; staminodia none; ovary free, sessile, 1 or spuriously 5-celled; style none or very short; stigmas 5, dilated or linear, simple or lobed, ovules numerous. Berry fleshy, sulcate, pulpy within, indehiscent. Seeds ovoid, sub-compressed; testa coriaceous or crustaceous, smooth, rugose, or echinate. Trees or shrubs with simple thick stems and milky sap. Leaves alternate, subpeltate, palmate, digitately divided into 7 to 9 lobes.

Carica with about twenty species is distributed from Southern Florida through the West-Indies to Southern Brazil and Argentina, and from Southern Mexico to Chili. The milk juice of *Carica* contains papaïne, which has the power of digesting albuminous substances, and the leaves are often used in tropical countries to make meat tender.

950. ***Carica Papaya*** L. Spec. Plant. I (1753). p. 1036. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 77. — *Papaya vulgaris* DC. Prodrum. XV, fasc. I p. 415. — Stems simple or rarely branched, thick, spongy inside. the leaves about the summit, on long petioles, glabrous, of about 7 pinnatifid lobes. On the male plants the flowers are borne on long drooping panicles, with often a few hermaphrodite or female flowers at the end; the flowers on the female plants are usually sessile or nearly so in the axils of the leaves. — Flow. February.

M. ma. N. d. Often cultivated in gardens, sometimes naturalized.

Local name: babâs.

This plant of Tropical America has become scarcely naturalized in many parts of the Subtropics.

Opuntiales.

Succulent herbs, shrubs or trees, armed with spines, leafless or nearly so, or rigid leafy herbs, furnished with more or less specialized hairs. Flowers perfect, solitary or cymose. Hypanthium present. Calyx of 4 or 5, or many sepals surmounting the hypanthium. Corolla of 4—5, or many petals. Androeceium of usually numerous stamens in several series or collected into groups and partially reduced to staminodia. Gynoeceium of 4 or 2-several united carpels. Ovary inferior, 1-celled, with 4 or several parietal placental. Ovules numerous. Fruit baccate or capsular.

71. Cactaceae.

Succulent shrubby plants, mostly peculiar to America, usually copiously furnished with spines, which arise from cushions of small or minute bristles (areolae). Leaves usually wanting. Stems depressed,

globose, columnar and terete or angled, or flattened and jointed or continuous. Inflorescence often axillary or lateral. Flowers usually large and showy, perfect, solitary. Calyx of few or numerous imbricated sepals, the inner series petal-like. Corolla of numerous petals in 2 or many series. Androecium of numerous stamens in several series. Filaments filiform, sometimes cohering with the base of the petals. Anthers introrse. Gynoecium of several united carpels. Ovary inferior, 1-celled, with several parietal placentae. Styles united, terminal, simple, elongated or pyramidal. Stigmas of the same number as the placentae, variable in shape. Ovules numerous, anatropous, horizontal. Fruit a fleshy berry, or rarely dry, smooth or more or less spiny. Seeds numerous, shining or tubercled, often with a dark more or less furrowed testa. Embryo curved, or thick, fleshy and rounded, in scant or copious endosperm.

The Cactus family with about twenty genera and a very large number of species is most abundant in the dry region adjacent to the boundary of the United States and Mexico.

364. *Opuntia* Mill.

Fleshy plants, with conspicuously jointed stems, the joints flat or terete. Leaves scale-like, caducous, spirally arranged. Areole axillary, usually spine-bearing. Flowers lateral, arising from the cushions of remote bristles of the areole. Hypanthium bearing areolae, not prolonged beyond the ovary. Sepals spreading, in several rows. Petals forming a rotate corolla. Ovary 1-celled, style cylindric; stigma 5—8-lobed. Berry more or less pear-shaped, fleshy or sometimes dry. Seeds flattened or disk-like. Embryo curved around the endosperm.

Opuntia with about 130 species is distributed from Southern New-England southward in the neighbourhood of the coast to the West-Indies, and through Western North-America to Chili, Brazil and Argentina, the largest number of species occurring near the boundary of the United States and Mexico.

A. Articles ovate-oblong; spines setaceous . . . 1. *O. Ficus Indica*.

B. Articles ovate-elliptical; spines piliferous . . . 2. *O. stricta*.

951. (1.) *Opuntia Ficus indica* (L.) Mill. Gardn. Diet., ed. VIII (1768), p. 2. — Ascherson-Schweinf. Illustr. Flor. d'Eg., p. 78. — Sickenberger Contrib. Flor. d'Eg., p. 78. — Stems erect 12—18 dm high, proliferous; trunk cylindric, woody in age, the joints thick, obovate to elliptic, 10—15 cm long, with the cushions of bristles immersed, spineless or sometimes with a very short spine; flowers yellow, 7.5—10 cm broad; fruit obovoid, bristly, 5—6 cm long, edible, the pulp red. — Flow. March.

N. d. N. v. N. f. O Cultivated everywhere and often subspontaneous.

Local name: tín shôk.

Origin from Middle and North America.

952. (2.) **Opuntia inermis** Haw. Plant. succ. (1812), p. 231. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 78. — Stems erect, 20—25 dm in height, often proliferous; trunk cylindric or nearly so, woody in age, the joints thick, obovate to elliptic, 10—30 cm long, with the cushions of bristles immersed; never with spines; flowers yellow, 7,5—10 cm broad or sometimes more; fruit ovoid, bristly, 8—9 cm long. — Flow. February to April.

M. ma. M. p. N. d. N. f. N. v. Cultivated and often subspontaneous. Origin from Middle America.

Myrtiflorae.

Herbs, shrubs or trees, unarmed, sometimes aquatic or amphibious. Leaves alternate or opposite; blades sometimes prominently 3-nerved. Flowers regular or irregular, complete, and often showy, or reduced to a stamen and pistil adnate to the hypanthium. Hypanthium merely enclosing the ovary or adnate to it. Androecium of few or many stamens. Anthers opening by slits or pores. Gynoecium 1-several-carpellary. Stigma terminating by style, or sessile. Fruit capsular or baccate, or resembling an achene.

72. Thymelaeaceae.

Shrubs with acrid juice, tough bark, simple entire tooth less leaves, without stipules, and regular perfect flowers, with a tubular or bell-shaped 4—5-cleft rarely entire calyx. Stamens commonly twice as many as the calyx lobes, in 2 rows: anthers 2-celled, opening lengthwise. Style simple: stigma capitate. Drupe with a single suspended anatropous seed, containing little or no albumen. Cotyledons plano-convex. Radicle superior.

A large family widely distributed over most parts of the globe.

365. Thymelaea Tourn.

Flowers perfect or polygamous-dioecious. Perigonium funnel-shaped, deciduous or persistent, tube continuous, limb 4-cleft, throat destitute of scale. Stamens 8, inserted in two rows at the apex of the tube, filaments very short. Style lateral, stigmas capitate. Nutlet included in perigonium, or naked. Albumen 0. — Shrubs with small, yellow flowers, and (ours) minute, fleshy, imbricated leaves.

A large genus widely distributed over most parts of the globe.

953. **Thymelaea hirsuta** (L.) Endl. Gen. Plant., Supplem. IV part. 2 (1847) p. 65. — Boiss. Flor. Or. IV, p. 1054. — Coss. Illustr. Flor. Atlant. II, p. 106 tab. 166. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 136 no. 592. — Passerina hirsuta L. Spec. Plant., p. 559. — Rehbch. Ic. XI, fig. 1168. — A shrub, 1 m high, or sometimes somewhat more, fastigiate-branched; twigs nodding. Leaves ovate to oblong, 2 mm long, convex at the upper surface, concave at the lower one, glabrescent. Flowers 5—10 in a cluster at or near the tip of the twigs, bractless, polygamous-dioecious; perigonium silky without, glabrous within, lobes somewhat shorter than the tube; fruit ovate, glabrous. — Flow. February to April.

M. ma. Alexandria-West and -East; Mandara; Abukir. — **M. p.** Rosetta; Damietta. — **D. i.** Bîr Abû Dafn near Ismailia.

Local name: metmân; omm-muknâna (Ascherson).

Also known from all the other parts of the Mediterranean region.

73. Elaeagnaceae.

Shrubs or trees, with silvery-scurfy leaves, and perfect or (by abortion) dioecious flowers, an inferior perigonium, 2—4-cleft, imbricated in the bud, a disk lining the tube, as many stamens as the lobes, inserted at the throat, a free ovary enclosed in the tube, with 1 erect ovule, developping into a one-celled, one-seeded fruit, closely invested by the pulpy tube, appearing like a drupe. — Pericarp crustaceous. Seed erect, anatropous, with an erect embryo, surrounded by a narrow albumen, and an inferior radicle.

A large family widely distributed over most parts of the globe.

366. Elaeagnus Linn.

Flowers perfect, or the male ones with an abortive ovary. Male flowers: Perigonium campanulate, 4—6-cleft. Stamens as many as teeth, alternate with them, included; filaments adherent for most of their length with the perigonium, anthers 2-celled, fixed by their back. Perfect flowers: Tube cylindrical, limb 4—6-cleft, deciduous. Stamens as above. Glandular disk surrounding the style to the throat of the tube. Ovary oblong 1-ovuled. Style elongated, stigma club-shaped. Fruit a false drupe, the pulp and stone formed by the growth and hardening of the perigonium-tube, pericarp membranous, 1-seeded, apiculate at the base of the style. Albumen small, embryo straight, radicle inferior. — Trees and shrubs, with alternate leaves.

A small genus widely distributed over most parts of the globe.

954. **Elaeagnus hortensis** M. Bieb. Flor. Taur. Cauc. II (1808), p. 112. — var. **orientalis** Schlechtd. ex Aschers.-Schweinf. Ill. Flor. d'Eg., p. 136 no. 953. — *Elaeagnus angustifolius* L. Spec. Plant. I, p. 176. — Sibth. and Smith Flor. Graec. Ic., tab. 152. — *Elaeagnus orientalis* L. Mant., p. 41. — A small tree, 5—8 m high, unarmed or spinescent. Leaves lenticular-lanceolate to lanceolate-linear, sometimes ovate, 2—6 cm long. Flowers 5 mm long, 1—3 in the axillary clusters; pedicels about as long as the silvery tube; lobes triangular, yellow within, rather shorter than the tube; style glabrous; fruit either small, tasteless, or as large as an olive, edible. — Flow. March to April.

M. ma. N. d. N. f. N. v. Cultivated everywhere in the gardens. — **D. i.** Ismailia (Schweinfurth).

Local name: negd (Delile); qureys (Ascherson); belleh; zezeyfün; the fruit: tamr-el-fu'âd (Figari).

Also known from Arabia Petraea and Syria.

74. Lythraceae*).

Calyx-tube free, but usually enclosing the ovary; lobes or primary teeth 4, 5, or sometimes more, very rarely 3, valvate in the bud, the sinus sometimes produced externally into as many accessory teeth. Petals as many as primary calyx-teeth or lobes, rarely deficient, inserted at the top of the calyx-tube, usually crumpled in the bud. Stamens as many or twice as many as petals or fewer, or rarely indefinite, inserted in the calyx-tube at various heights; filaments inflected in the bud; anthers versatile, with parallel cells opening longitudinally. Ovary free from the calyx, but usually enclosed in its tube, 2 or more-celled, or rarely 1-celled by the abortion of the partitions; style simple, the stigma capitate or rarely 2-lobed. Ovules usually numerous, anatropous, attached to the axis, or very rarely parietal. Fruit a membranous coriaceous or hard capsule, variously dehiscent, enclosed in or surrounded by the persistent calyx, the valves usually detaching themselves from the central persistent placentiferous column. Seeds without albumen; testa coriaceous, membranous or rarely thick; embryo straight; cotyledons oblong or orbicular-cordate; radicle short, or rarely cotyledons small and radicle long. — Herbs, shrubs or trees. Leaves opposite, verticillate or sometimes alternate, entire, without stipules.

*) The classification of the family in this work is that followed by E. Koehne in his well-known *Lythraceae* in Engler, *das Pflanzenreich* IV. Fasc. 216 (1903).

Flowers in axillary or terminal panicles cymes or clusters, rarely solitary.

A considerable Order, some of the herbaceous genera spread over the greater part of the globe, the larger woody-stemmed ones confined to the tropics in the Old or the New World.

A. Herbs.

I. Calyx tubular. Ovary 2-celled 1. **Lythrum**.

II. Calyx campamulate 2. **Ammannia**.

B. Shrubs or trees 3. **Lawsonia**.

367. (1.) **Lythrum** Linn.

Calyx tubular, 8—12-ribbed, with 4—6 triangular often very short primary lobes or teeth, the sinus produced into as many external accessory ones, short or spreading, or erect and longer than the primary ones. Petals 4—6. Stamens twice as many as petals or fewer, inserted below the middle of the calyx. Ovary 2-celled (or very rarely 3-celled?), with several ovules in each cell; style filiform, with a minute or capitate stigma. Capsule included in the persistent calyx, oblong or globular, opening in septicidal valves at the top or bursting irregularly. Seeds numerous, small. — Herbs or rarely undershrubs, glabrous or villous. Leaves opposite, verticillate or the upper ones alternate, usually narrow. Flowers solitary, or 3—5 together in the axils, sessile or pedunculate.

The genus is spread over most parts of the globe.

A. Pale-green plants 1. **L. tribracteatum**.

B. Canescent or glaucous plant.

I. Petals obtuse, three times shorter than the tube.

a) Fructiferous calyx 4—7 mm long . . 2. **L. hyssopifolium**.

b) Fructiferous calyx 2,5—3 mm long . 3. **L. thymifolium**.

II. Petals acute, as long as the calyx or longer 4. **L. flexuosum**.

955. (1.) **Lythrum tribracteatum** Salzm. in Benth. Cat. (1826), p. 98. — Koehne in Engler, Das Pflanzenreich IV, fasc. 216, p. 64. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 75 no. 430. — **Lythrum tribracteatum** var. **cuneifolium** Ten. in Ann. Stor. Nat. Bologna IV, p. 428. — **Lythrum nanum** Nym. Syll., ed. 2 Vol. II p. 252. — not Karel and Kir. — **Lythrum bibracteatum** DC. Prodrum. III, p. 81. — Boiss. Flor. Or. II, p. 740. — Sickenberg. Contrib. Flor. d'Eg., p. 230. — An perennial herb. Stems usually diffuse, sometimes erect. Lower leaves elliptical-oblong, often cordate, the upper ones linear-lanceolate to linear, spreading. Flowers 10—12-androus, longer

stamens exserted; calyx-teeth 12, nearly equal, triangular; petals twice as long as the calyx. — Flow. January to March.

N. d. N. f. N. v. Common on way-sides and on waste places. — **O.** Dakhel; Great Oasis. — **D. l.** Abusîr near Saqqâra in deep sand.

Also known from the other parts of the Mediterranean region, Western France, Hungary, Middle Russia and Western Asia.

956. (2.) **Lythrum hyssopifolium** L. Spec. Plant. I (1753), p. 447. — Koehne in Engler, Das Pflanzenreich IV, fasc. 216 p. 65. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 75 no. 428. — Pentaglossum linifolium Forsk. Flor. aeg.-arab., p. 11. — Salicaria hyssopifolia Lam. Flor. Franc. III, p. 103. — Lythrum thymifolia Krock. Flor. Siles. II, p. 92 not of Linn. — DC. Prodrum. III, p. 81. — Stem prostrate or procumbent, terete, with angular branches, 5—50 cm long. Leaves alternate, linear, the lower ones oblong-lanceolate acute, not more than 1—2 cm long. Bracts deciduous, linear, shorter than the calyx. Calyx narrowly tubular, 8-veined, the 4 stronger veins proceeding to the cornua; calyx-lobes shorter than the cornua. Petals ligulate or obovate. Stamens 2, opposite, not exceeding the calyx-tube, and inserted at a third above its base. Ovary oblong, equalling the erect style which reaches to the level of the stamens. Capsule oblong, subquadrangular. — Flow. March to April.

N. d. Alexandria; Damanhur; Mansûra; Tanta; Zaqaziq; Qalyub; Cairo and environs, on way-sides. — **N. f.** Medînet-el-Fayûm; Tamia; Senûris; Senhûr. — **N. v.** Common everywhere. — **O.** Little Oasis: Farâfra, Dakhel.

Local name: rich-hamâma.

Everywhere in the Mediterranean basin and Middle Europe; Abyssinia, Cape, Australia, America.

957. (3.) **Lythrum thymifolium** L. Spec. Plant. I (1753), p. 447. — Koehne in Engler, Das Pflanzenreich IV, fasc. 216 p. 67. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 75 no. 429. — Salicaria thymifolia Lam. Flor. Franc. III, p. 103. — Lythrum hyssopifolia var. minima Moris sec. Gren. and Godr. Flor. Franc., p. 596. — A small herb; stems 7—20 cm long. Leaves 3—9 mm long, 5—15 mm broad, small-linear or sometimes the stem-ones lanceolate-linear or rarely oblong, serrulate-scabrous at the margin. Flowers 4-merous; stamens 2. — Flow. March (?).

N. d. (?) Without locality collected by Figari.

Also known from Algeria, Southern Europe, South-East-Russia, Middle-Asia and America.

958. (4.) **Lythrum flexuosum** Lag. Cat. Hort. Matr. XVI (1816), no. 210. — Koehne in Engler, Das Pflanzenreich IV, fasc. 216 p. 68.

— Aschers.-Schweinf. Ill. Flor. d'Eg., p. 75 no. 427. — *Lythrum thymifolia* All. Fl. Pedem. II, p. 168 not Linn. — *Lythrum Graefferi* Ten. Cat., ed. 2 p. 45. — *Lythrum flexuosum* DC. Prodrum. III, p. 82. — *Lythrum maculatum* Boiss. and Reut. Diagnos. Plant. Nov. Hisp., p. 22. — Stems 20—72 cm long, often numerous, ascending. Leaves 5—30 mm long, 1—9 mm broad, oval, oblong, lanceolate, the upper-ones narrow-linear; calyx 5—7 mm long; stamens 6, long exserted. — Flow. March to April.

N. d. Alexandria near the canal; Qabâry; Damietta.

Widely distributed in Southern Europe and Northern Africa.

368. (2.) *Ammannia* Linn.

Calyx membranous, persistent, campanulate in flower, with 4 deltoid lobes and 4 external cornua narrower than the lobes. Petals 4, caducous or wanting, usually not larger than the calyx-lobes, white, violet purplish rose-coloured or yellow, not corrugated in bud. Stamens 4, opposite the calyx-lobes, or 8, in one row, usually arising from near the base of the calyx-tube, about the length of the calyx or exserted; filaments slender. Ovary free, 1—4-celled; ovules numerous; style filiform, persistent, usually short or long according as the stamens are included in the calyx or exserted; stigma capitate. Capsule usually spherical and exceeding the calyx, bursting irregularly, more or less circumsciss, usually 1-celled and longer than the calyx; placentation ovoid, compressed or peltate. Seeds numerous, small, globular or triangular in outline, often concave on one side; radicle very short. In a few species the flowers are occasionally pentamerous. — Annual or biennial herbs, with leaves sessile, or subsessile, usually glabrous and opposite. Flowers in axillary cymes, with 2 bracteoles at the base of the pedicels.

Occurs in damp places in the Tropics of both hemispheres; some species are extratropical, and one is naturalized in Italy.

A. Style 0,3 mm long or longer, filiform; petals

present 1. *A. auriculata*.

B. Style 0,2 mm long or 0, thickly; petals 0.

I. Stems and branches not or only somewhat alate.

a) Calyx with small appendix 2. *A. senegalensis*.

b) Calyx without an appendix 3. *A. baccifera*.

II. Stems and branches broad alate 4. *A. attenuata*.

959. (1.) *Ammannia auriculata* Willd. Hort. Berol. I (1806), tab. 7. — Koehne in Engler, Das Pflanzenreich IV, fasc. 216 p. 45.

— Aschers.-Schweinf. Ill. Flor. d'Eg., p. 75 no. 431. — Sickenberg. Contrib. Flor. d'Eg., p. 230. — Stems up to 57 cm long, dense branched. Leaves 15—77 mm long, 3—14 mm broad, the upper one smaller, the lowest two cuneate, the other all auriculate, linear or lanceolate, acute. Dichasia 3—15-flowered, loose, pedicels 3 to 17 mm long; calyx 1.5—2 mm long, the fructiferous one subglobose or semiglobose with small nerves; lobes of the tube equal; petals violet, purple or white; stamens 8—4; style half as long as the ovary. — Flow. February to March.

N. d. Alexandria; Damietta; Damanhur; Cairo, rare. — **O.** Little Oasis; Dakhel; Great Oasis.

Also known from Tropical Africa, Asia, Australia and America.

960. (2.) **Ammannia senegalensis** Lam. Illustr. I (1791), p. 312 tab. 77 fig. 2. — Koehne in Engler, Das Pflanzenreich IV, fasc. 216 p. 52. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 75 no. 432. — Sickenberg. Contrib. Flor. d'Eg., p. 230. — Glabrous. Stem erect or procumbent, usually tetragonal or 4-winged, sometimes subterete, 2 to 50 cm high. Leaves linear oblong or lanceolate, blunt at the base, usually auriculate-cordate and amplexicaul, 5—20 mm long, patent. Peduncles bearing one few or many pedicelled flowers, smaller towards the extremities of the stem and branches. Calyx campanulate, 8-ribbed. Petals 4, caducous or wanting, white or coloured. Stamens 4 or 8, exserted or as long as the calyx. Style long or short. Occasionally a flower is pentamerous. — Flow. February to April.

N. d. Damietta; Rosetta; Menzale.

Also known from Tropical Africa to South Africa.

961. (3.) **Ammannia baccifera** (L.) Koehne in Engler's Bot. Jah. I (1880), p. 258. — Koehne in Engler, Das Pflanzenreich IV, fasc. 216 p. 53. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 75 no. 434. — Glabrous annual with erect stem and spreading tetragonal branches, 5—24 cm high, reddish at the base. Leaves linear-lanceolate, attenuate to base, subsessile, usually patent, often shining, 1—5 $\frac{1}{4}$ cm long. Cymes 3—7-flowered, pedicelled, with small bracteoles at the base of pedicels similar to the leaves. Calyx with 4 deltoid lobes, 8-veined; cornua small. Petals 4, small, caducous or wanting. Stamens 4, inserted below the middle of the calyx-tube, about equalling the calyx. Ovary sessile, enclosed in calyx-tube; style very short. Capsule globular, exceeding the calyx, dehiscing transversely about the middle, 1- or imperfectly 2-celled; placenta compressed. Rarely a flower is pentamerous. — Flow. March to April.

N. d. N. f. Common on soil ground.

Local name: rigl-hammâma (Schweinfurth).

Also known from Africa, South- and East-Asia, introduced in Europe.

var. **aegyptiaca** (Willd.) Koehne in Engler's Bot. Jahrb. I (1880), p. 258. — Koehne in Engler, Das Pflanzenreich IV, fasc. 216 p. 55. — *Ammannia aegyptiaca* Del. Illustr. Flor. d'Eg., p. 37 tab. 15 fig. 3. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 75 no. 434. — *Ammannia auriculata* β subsessilis Boiss. Flor. Or. II, p. 743. — *Ammannia salicifolia* Monti in Comment. Bonon. I, p. 112. — *Ammannia densiflora* Hohenacker, no. 770. — DC. Prodrum. III, p. 78. — Glabrous annual, 8—36 cm high. Stem erect, terete at base, with long quadrangular spreading branches. Leaves lanceolate, narrowing gently from above middle towards the base, sessile, sometimes auricled at the base, not amplexicaul, opposite, patent at the flowering parts deflected at the fruiting parts, 1-veined, 1—2½ cm long. Flowers in axillary sessile cymes with very short pedicels, densely verticilled especially in fruit, 4—9 in each axil. Calyx with a short four-cornered spreading limb at the top of a tube campanulate in flower and hemispherical in fruit; lobes of calyx 4, deltoid, incurved in flower, usually with short patent cornua. Petals wanting or caducous. Stamens 4, not exceeding the calyx, arising from near the base of its tube. Ovary when young obovoid, with 4 external longitudinal lines; style very short. Capsule 1-celled. Seeds attached to a placenta which in middle of capsule is compressed horizontally in a peltate manner and at the top and bottom consists of a central axis, somewhat triangular in outline, concave, very minutely punctate. — Flow. January to March.

N. d. N. f. Common along the irrigation-canals. — **O.** Little Oasis; Farâfra; Dakhel; Great Oasis.

Local name: rigl-hammâma (Schweinfurth).

Also known from Southern Europe, Africa and Asia.

962. (4.) **Ammannia attenuata** A. Rich. Flor. Abyss. I (1847), p. 278. — Koehne in Engler, Das Pflanzenreich IV, fasc. 216 p. 53. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 75 no. 433. — Sickenberg. Contrib. Flor. d'Eg., p. 230. — Stems 6—80 cm long, strictly erect, more robust than in the preceeding species. Leaves 18—87 mm long, 2—10 mm broad, the lower-one obtuse the other acute, lanceolate or linear-lanceolate. Dichasia 7—12-flowered, loose, sessile or shortly peduncled; pedicels 2—2.5 mm long; calyx 1.2 to 1.5 mm long, the fructiferous semiglobose; lobes recurved, small; capsule longer than the lobes. — Flow. March to April.

N. v. Cataractes near Aswân.

Also known from Tropical Africa.

369. (3.) *Lawsonia*.

Calyx with short campanulate tube, 4 diverging ovate acute or mucronate lobes and a callous ring at the top of the tube into which petals and stamens are inserted; without cornua. Petals 4, widely obovate, subcordate, corrugated in bud. Stamens 4—8, equal, opposite and longer than the lobes of the calyx, alternating singly or in occasional pairs with the petals; filaments tapering; anthers widely oblong. Style as long as the stamens, persistent; stigma punctiform; ovary free, sessile, globose, not included in tube of the calyx, 4-celled. Placenta central, with 4 lobes projecting into the cells of the ovary. Capsule globular, bursting irregularly across, 2- or 4-celled; septa membranous; pericarp thin, brittle. Seeds large, pyramidal; testa thick; embryo straight; radicle $\frac{1}{3}$ length of embryo, cylindrical; cotyledons thick, $\frac{5}{6}$ length of embryo, cordate-aureoled at base, embracing the radicle. — Glabrous shrub with opposite leaves and branches. Inflorescence in terminal and lateral paniced cymes. Bracts small, deciduous.

This genus has but one species, and is widely cultivated.

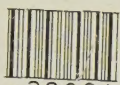
963. *Lawsonia inermis* L. Spec. Plant. I (1753), p. 349. — Koehne in Engler, Das Pflanzenreich IV, fasc. 216 p. 20. — Aschers.-Schweinf. Ill. Flor. d'Eg., p. 75 no. 435. — Sickenberg. Contrib. Flor. d'Eg., p. 230. — *Lawsonia spinosa* L. Spec. Plant. I, p. 349. — *Lawsonia alba* Lam. Encyclop. III. p. 106. — Shrub 2 m high, with terete stem and subterete divaricate branches, of same pale colour throughout. Leaves elliptic or obovate, cuneate at the base into short petiole, usually acute or spinous-pointed at the apex, submembranous, entire, 1—2½ cm long; midrib depressed on upper surface of leaf; lateral veins not conspicuous. Flowers sweet-scented. Pedicels about 2—5 mm long, slender. Tube of calyx $\frac{1}{3}$ length of the calyx; lobes pointed. Petals greenish-white. Stamens usually 4, alternating with the petals; sometimes more numerous when a pair springs from near the same point of the callous ring of the calyx between the petals. Capsule 3—4 mm in diameter. — Flow. February to March.

M. ma. Alexandria, naturalized. — **M. p. N. d. N. f. N. v.** Cultivated everywhere.

Local name: tamr-el-hinnâ; limnâ.

Originally from East-Africa to East-India, now everywhere in the Tropics. — The plant is sometimes spinous, and then it is *L. spinosa*, Linn.; in other cases it is *L. inermis*, Linn. Often cultivated under the name of Henna, and used as a dye. The leaves are ground in their raw state, and then mixed with lime-juice, to be put on the tips of the fingers, either to stain them red or to prevent whitlow.

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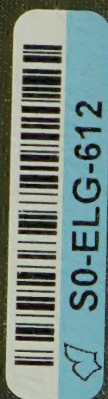
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